City and County of San Francisco
Department of City Planning

300 ULLOA STREET
13-UNIT RESIDENTIAL DEVELOPMENT
Draft Environmental Impact Report
90.079E

Draft EIR Publication Date:	November 29, 1990
Draft EIR Public Hearing Date:	January 10, 1991
Draft EIR Public Comment Period:	November 29, 1990 to January 10, 1991

Written comments should be sent to:
The Environmental Review Officer
450 McAllister Street, Sixth Floor
San Francisco, California 94102

City and County of San Francisco
Department of City Planning

450 McAllister Street
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DATE: November 29, 1990

TO: Distribution List for the 300 Ulloa Street 13-Unit Residential Development Draft EIR

FROM: Barbara W. Sahm, Environmental Review Officer

SUBJECT: Request for the Final Environmental Impact Report for the 300 Ulloa Street 13-Unit Residential Development

This is the Draft Environmental Impact Report (EIR) for the 300 Ulloa Street 13-Unit Residential Development project. A public hearing will be held on the adequacy and accuracy of this document on January 10, 1991. After the public hearing, our office will prepare and publish a document entitled "Summary of Comments and Responses" which will contain a summary of all relevant comments on this Draft EIR and our responses to those comments. It may also specify changes to this Draft EIR. Those who testify at the hearing on the Draft will automatically receive a copy of the Comments and Responses document along with a notice of the date reserved for certification (usually about nine weeks after the hearing on the draft); others may receive such copies and notice on request or by visiting our office. This Draft EIR, together with the Summary of Comments and Responses document, will be considered by the City Planning Commission at an advertised public meeting and certified as a Final EIR if deemed adequate.

After certification, we will modify the Draft EIR as specified by the Comments and Responses document and print both documents in a single publication called the Final Environmental Impact Report. <u>The Final EIR will add no new information to the combination of the two documents except to reproduce the certification resolution</u>. It simply will provide the information in one rather than two documents. Therefore, if you receive a copy of the Comments and Responses document, you technically will have a copy of the Final EIR.

We are aware that many people who receive the Draft EIR and Comments and Responses have no interest in receiving virtually the same information after the EIR has been certified. To avoid spending money and paper needlessly, we would like to send copies of the Final EIR to private individuals only if they request them.

If you want a copy of the Final EIR, please so indicate in the space provided on the next page and mail the request to the Office of Environmental Review within two weeks of certification of the EIR. Any private party not requesting a Final EIR by that time will not be mailed a copy. Public agencies on the distribution list will automatically receive a copy of the Final EIR.

Thank you for your interest in this project.

300 Ulloa Street,
13-unit residential
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Attn: Ms. Carol Roos, EIR Coordinator
90.079E - 300 Ulloa Street

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RETURN REQUEST REQUIRED FOR FINAL ENVIRONMENTAL IMPACT REPORT

REQUEST FOR FINAL ENVIRONMENTAL IMPACT REPORT

TO: Department of City Planning
Office of Environmental Review

Please send me a copy of the Final EIR

SIGNED: ______________________________

Print Your Name and Address Below:

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City and County of San Francisco
Department of City Planning

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300 Ulloa Street
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I. INTRODUCTION

A. BACKGROUND TO THIS EIR

An environmental evaluation application for a 120-bedroom residential care facility was filed by the project sponsor on June 23, 1987 (Case No. 87.399E). A preliminary Negative Declaration was published by the Department of City Planning, April 29, 1988, and amended, May 23 and July 1, 1988 (see Appendix A, page A-4). Upon appeal of that Negative Declaration, in July, 1988, the City Planning Commission required the preparation and identified the scope of an EIR on that project. In June, 1989, a Draft EIR (DEIR) on that project was published, and in August, 1989, the City Planning Commission held a public hearing on the DEIR and received written comments.

The project sponsor subsequently withdrew the residential care facility application and on February 12, 1990 filed an application for a Conditional Use permit to build 13 single-family detached housing units on the site. This is the currently proposed project analyzed in this EIR. The 1989 DEIR assessed potential effects on the environment in the areas of geologic, transportation, noise, visual, open space, and population impacts for the prior residential care facility project. This EIR addresses the same specific issues for the currently proposed project and considered comments on the 1989 DEIR relevant to this project during preparation. Not all of the impacts presented in the EIR are physical environmental effects as defined by the California Environmental Quality Act (CEQA). Non-physical effects are included for informational purposes only.

II. SUMMARY

A. PROJECT DESCRIPTION

The site is a 143,600 square-foot site, long-abandoned rock quarry (Assessor's Block 2876, Lot 7) located north of Ulloa Street, west of Waithman Way (one block north of Portola Drive). The site consists of a graded bench, partly developed with the First Church of the Nazarene, and a steep hillside which extends uphill (northwest) to Edgehill Way. The site is zoned RH-1(D) (Single-Family Detached) and is surrounded by single-family development on the north, south, and east. It is contiguous to City-owned open space on the west.

The proposed project is to subdivide the site into residential lots and build 13 single-family homes, create a commonly-owned open space parcel covering the site access road and steep hillside, and retain the existing church. Access would be provided from Ulloa Street, as at present, and would include a private roadway extending to a cul-de-sac near the western site boundary.

Housing units would be three stories with maximum heights of 35 feet. Units would be set back about 34 feet from a hillside retaining wall on the north, about 15 to 32 feet from the southern property line, 10 feet from the western property line, and about 50 feet from the church.

Two off-street parking spaces would be provided in the garage of each unit, and seven on-street spaces would be provided across from the homes in street "bulbs". Another new 40 on-site spaces would be provided for the church, including 18 spaces in a designated parking area and 22 spaces on the main access road, for a total of 73 net new spaces with the project.

The project would stabilize the slope above the homesites and would remove loose and weak rocks, boulders, and rubble (about 4,500 cubic yards plus another 1,500 cubic yards on the bench), remove about 112 trees (15 on the hillside and 97 below the bench), reshape the crest of the slope, install rock bolts and wire mesh, build a 5- to 12-foot high catchment and retaining wall at the new toe of the slope, and plant landscaping. Maintenance of the slope in the future would be the responsibility of the homeowners' association.

Project construction is expected to take about 14 months and would cost about $4,400,000. The project is proposed as a Planned Unit Development (PUD) under Section 304 of the City Planning Code and would require Conditional Use authorization by the City Planning Commission.

B. ENVIRONMENTAL EFFECTS

GEOLOGY (Pages 45-54)

Without stabilization, the site's hillside would weather and ravel gradually over time. In addition, more rapid landslides and rockfalls could occur following periods of intense rainfall or moderate to strong seismic events. These natural processes would be expected with or without site development unless hillside stabilization and other protective measures were made. Excavation for development without implementation of slope stabilization measures could increase instability of existing slopes. Such measures would not preclude future rockfalls from occurring or eliminate the natural geotechnical processes from continuing on the site. Instead, measures designed to accommodate rockfalls and sloughing/raveling would minimize the hazards from slope instability. Geotechnical consultants differ on whether slope instability on the site is deep-seated or surficial in nature, specific elements to be required in a mitigation program, and design details of those elements.

TRANSPORTATION (Pages 54-60)

Construction impacts associated with the project would consist of truck trips and construction worker vehicle trips during the 14-month construction period. Slope stabilization would involve removal of approximately 4,500 cubic yards of rock and soil and would require about 860 truck trips during the initial one-month period. As many as 30 truck trips could be made per day (15 to the site empty and 15 from the site full). Site improvement and home development would involve removal of approximately 1,500 cubic yards more of rock and soil, primarily from utility trenches, which would require a maximum of 10 truck trips to and 10 trips from the site per day for about four weeks.

The project would generate about 130 daily one-way vehicle trips (trip-ends) and about 14 vehicle trips during the peak afternoon traffic hour which would occur between 4:15 and 5:15 PM. The peak hour of the project would roughly correspond with the PM peak period (between 4:45 and 6:15 PM) of other surrounding streets (Portola Drive and Laguna Honda Boulevard). The project peak would be later than that for the 200-block of Ulloa Street (between 2:00 and 3:30 PM).

About 25% of inbound traffic to the site would be expected to use Ulloa Street west of the site with 75% of the inbound traffic using Waithman Way; 45% of outbound traffic leaving the site would be expected to use Ulloa Street east of the site with 55% using Waithman Way.

Project generated traffic would not change the existing (1987-1988) or future (1997) levels of service (LOS) at

the Portola Drive-Laguna Honda Boulevard, Portola Drive-Miraloma-Marne, or Portola Drive-Kensington Way intersections during the PM peak hour. The project would increase the volume/capacity (V/C) ratio by 0.01 at the Portola Drive-Laguna Honda Boulevard intersection. Because this increase is less than present daily traffic fluctuations, it is not likely to be noticeable. Using the TIRE methodology (Traffic Infusion in a Residential Environment), it is estimated that project traffic impacts would not be noticeable on residential streets, since the index value would increase by 0.02 on the 200-block of Ulloa Street; index changes of less than 0.10 are not considered noticeable.

The proposed project and existing church would generate combined parking demand of 42 to 56 parking spaces on an average Sunday, the peak parking demand for the project vicinity. The project would provide 26 spaces for residents, 7 additional spaces along the access road, and 40 spaces for the church, for a total of 73 on-site parking spaces, a surplus of about 17 spaces compared to demand on an average Sunday.

The project would not be expected to have a noticeable impact on truck access.

NOISE (Pages 60-64)

Noise levels would be generated during project construction within a 5- to 10-dBA range of 75 to 80 dBA when several pieces of equipment are used. These noise levels would interfere with conversations inside and outside nearby homes. Maximum instantaneous noise levels would be expected to reach 80 to 85 dBA in the rear yards of homes located on the north side of Ulloa Street, 70 to 75 dBA outside homes on Rockwood Court, and 75 to 80 dBA outside the nearest homes on Edgehill Way. Construction trucks would generate an average noise level of 50 to 55 dBA and a maximum noise level of about 80 dBA outside homes on streets used by these vehicles -- similar to the noise levels generated by buses and trucks on nearby streets.

During operation, project-generated traffic would increase noise levels by less than one decibel on local streets and by about one decibel at the facade of 320 Ulloa Street (the home nearest to the site driveway).

URBAN DESIGN (Pages 64-69)

The site is visible from many locations on or near Portola Drive, including the developed residential neighborhood located on the lower elevations of Mount Davidson to the southeast. It is not visible from public open space areas on top or the non-forested grasslands of Mount Davidson (unobstructed views of surrounding neighborhoods are possible from the latter).

The project would introduce development to the undeveloped part of the site, and the proposed single-family

units would be visible from many locations. Bare slopes would be visible after trees and rocks/soil are removed for stabilization. Rock bolts and wire mesh installed on the hillside would be visible from some on- and off-site locations nearby but not from farther distant locations. About 112 trees would be removed. Landscaping planted on the site would not match the size of trees cut down by the project, approximately two-thirds of which are under six inches in diameter and are considered to be immature (younger than 15 years old), but proposed landscaping would mature gradually, according to the species used, planting techniques, and maintenance.

OPEN SPACE (Page 69)

The project site is adjacent to unimproved open space under City Recreation and Park Department jurisdiction. The project would provide public access to the open space via a sidewalk from Ulloa Street along the site's private main access roadway.

POPULATION (Page 69)

Project implementation would result in a maximum of about 50 temporary construction workers on-site at any one time and would introduce about 50 permanent residents upon completion and full occupancy.

C. MITIGATION MEASURES

No significant project-specific or cumulative impacts have been identified, and, therefore, no mitigation measures would be needed. Several features are included in the project to reduce or eliminate possible geotechnical impacts. In addition, the Bureau of Building Inspection (BBI) would review final building plans, geotechnical studies prepared for the project, and slope stabilization measures. The BBI would require that additional site-specific reports be prepared in conjunction with permit applications, as needed. In addition, the BBI has the right to impose additional measures, as necessary.

D. ALTERNATIVES TO THE PROPOSED PROJECT

ALTERNATIVES NOT INCLUDED

No alternative site analysis was conducted for this EIR for a number of reasons. The project would be infill development, similar to many housing proposals in San Francisco. The project site would be difficult to

develop due to geotechnical constraints and is also similar to many housing opportunity sites in the City with geotechnical constraints. If an alternative site were chosen to develop with housing as proposed by the project, the 300 Ulloa Street site would remain vacant (as in the No Project Alternative) and would continue to be subject to rockfalls and raveling. It would be speculative to choose an alternative site from among the vacant sites in the City zoned for residential use, which the Department of City Planning estimates could accommodate about 1,500 units. The Department estimates there are about 580 acres of undeveloped and underdeveloped land suitable for housing development throughout the City, not all of which is currently zoned for residential development.

ALTERNATIVE A -- NO PROJECT

This alternative would not change the project site. No new development would take place, and no slope stabilization measures would be implemented. The existing church would continue to function as at present. This alternative would allow the site to remain vacant for other potential uses in the future.

ALTERNATIVE B -- 120-UNIT RESIDENTIAL CARE FACILITY

Alternative B would result in development of a 93,660 square-foot residential care facility containing a maximum of 120 bedrooms, accommodating about 140 residents at full occupancy, and 26 employees. The building would consist of 2 to 4 stories over parking with an average height of 30.5 feet (maximum of 40 feet). Off-street parking would be provided for 61 cars (21 project spaces and 40 church spaces). This alternative would be exposed to the same geotechnical conditions as the project and would require similar slope stabilization measures. The building under this alternative would be located closer to a retaining wall at the new toe of the hillside (set back 10 feet) than project homes (34 feet). This alternative would generate about 200 one-way vehicle trips per day (54% more than the project), 36 of which would be made during the peak period of 2:00 to 3:30 PM which corresponds to the peak period at St. Brendan's School in the 200-block of Ulloa Street. Traffic and construction noise generated by this alternative would be similar to that for the project, except that implementation of this alternative would last two to four months longer than the project; therefore, construction noise would continue over a longer period. Rooftop mechanical equipment needed for this alternative would introduce a new source of noise on the site; noise levels generated would be audible at off-site locations but would be masked by traffic noise except during late night and early morning.

ALTERNATIVE C -- 31 DWELLING UNITS, SINGLE FAMILY RESIDENTIAL

Alternative C would result in site development with 31 single-family homes in accordance with Planned Unit Development (PUD) zoning provisions, consisting of 28 attached dwellings with access from Ulloa Street and 3

detached dwellings fronting on Edgehill Way. The attached units would be 1,500 square feet in size and four stories with three bedrooms each and two units built per lot while detached units would be 2,500 square feet in size and four stories with four to five bedrooms each. Slope stabilization of the site would consist of the following measures: building an underpinning wall along Edgehill Way which would consist of drilled, cast-in-place concrete piers connected by a reinforced concrete grade beam and tied back across the road; scaling loose rocks off the prominent bedrock outcrop and installing rock bolts and wire mesh below the underpinning wall (only mesh would be draped over the rock cliff west of the wall); flattening the overhanging or steep slopes in the western portion of the site; and building a six- to eight-foot-high reinforced concrete catchment wall at the toe of the major slope. This slope stabilization program would be more extensive than the program proposed for the project because it would include an underpinning system which would be required to support Edgehill Way to permit residential construction along that street. This alternative would generate an estimated 240 average weekday trip ends of which about 210 daily trips would be made from development on the bench (compared to 130 daily trips with the project) and about 27 to 30 additional daily vehicle trips would be added to Edgehill Way. The latter trips generated from the 3 detached units would increase the TIRE Index number of the area adjacent to the project site on Edgehill Way by slightly more than 0.10, which is above the threshold of noticeability. Alternative C would generate about 24 trips during the PM peak hour (4:15 to 5:15 PM). Construction of Alternative C development would take a similar amount of time as the project, but development-generated noise would not differ from the levels expected with the project. Development on Edgehill Way primarily would occur out of the line-of-sight of existing Edgehill Way homes. Traffic-generated noise levels would be similar to those of the project.

Residential development of Alternative C would appear similar in character with surrounding residential development but would not necessarily appear to be a visually logical extension of the neighborhood. The resulting horizontal band of attached units would appear to be a continuous, unbroken mass; detached units on Edgehill Way could be prominent visually.

III. PROJECT DESCRIPTION

A. PROJECT SPONSOR'S OBJECTIVES

The project sponsor proposes to subdivide Lot 7 in Assessor's Block 2876 into 15 lots and build 13 single-family detached homes. The subdivision would create a separate, approximately 18,000 square-foot lot for the existing First Church of the Nazarene. The proposed project would not alter the existing 7,700-square foot church. The remaining 125,600 square feet of site area would be subdivided into 13 lots for construction of single-family homes and 1 lot to be owned by a homeowners' association which would consist of an access road and common open space.

B. PROJECT LOCATION

The project site, Lot 7 in Assessor's Block 2876, is approximately 3.3 acres (143,600 square feet) and irregularly-shaped. The site is located on the north side of Ulloa Street, immediately west of Waithman Way in the West Portal area of San Francisco (see Figure 1, page 9). It extends from Ulloa Street uphill to Edgehill Way and is comprised of a long-abandoned rock quarry characterized by exposed rock walls and fallen debris. The site is surrounded by single-family residential development on the north, east, and south and is contiguous to City-owned open space on the west. The First Church of the Nazarene is on the site, and St. Brendan's Church and School are located one block west on Ulloa Street.

The site is in an RH-1(D) (Single-Family Detached) zoning district and 40-X height and bulk district. RH-1(D) zoning permits single-family homes with side yards as required by Section 133 of the City Planning Code with a minimum lot size of 4,000 square feet. As a standard subdivision, the allowable density for the site would be 25 units. As a planned unit development under Section 304 of the City Planning Code, the maximum allowable dwelling unit density would be 33 units in other than standard lot configuration.

C. PROJECT CHARACTERISTICS

Project characteristics are summarized in Table 1, page 10, are illustrated in plans, elevations, and sections in Figures 2 through 4, pages 11 through 13, and are described below.

The project would subdivide the 143,600-square foot parcel currently owned by the First Church of the Nazarene.

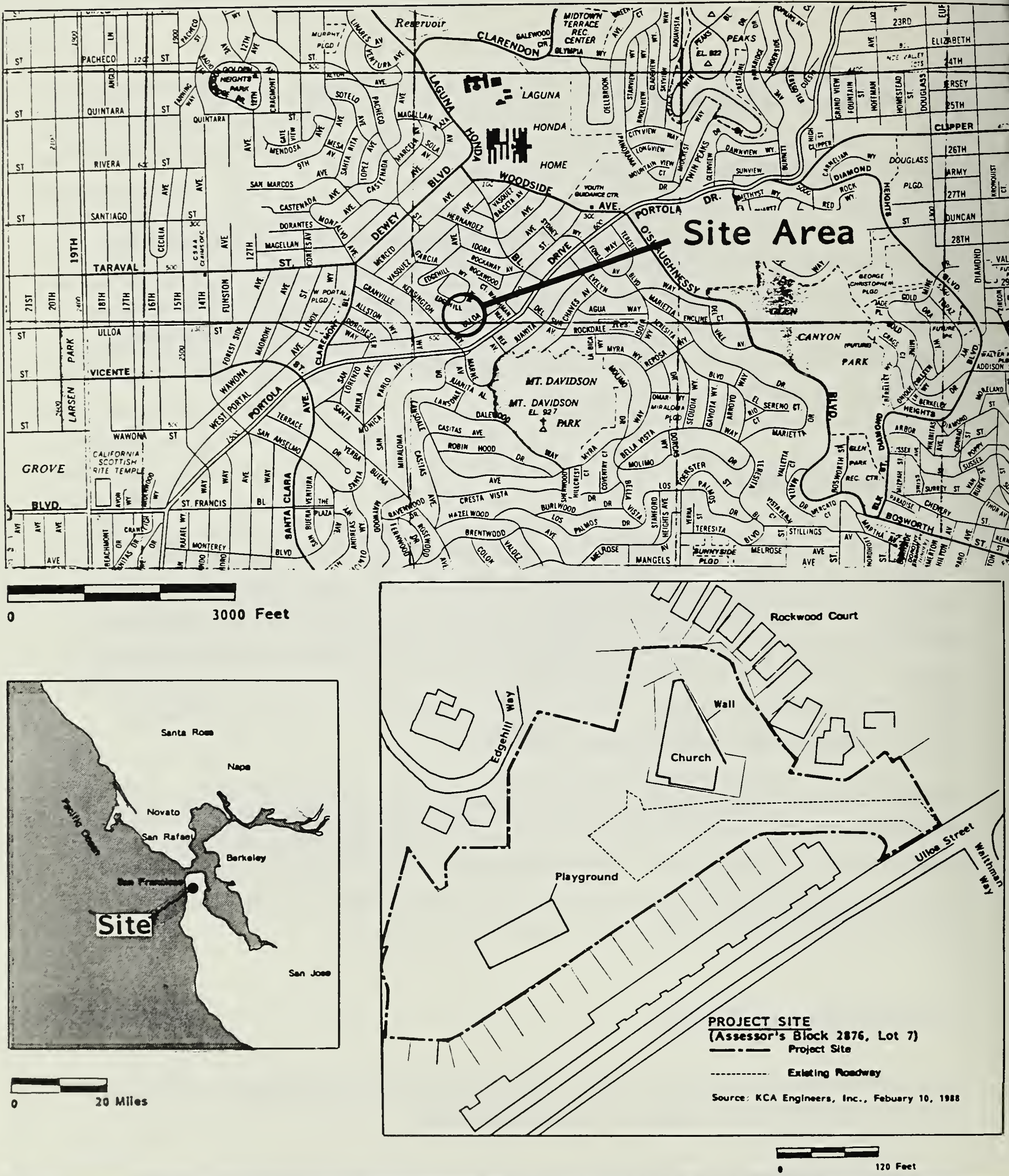

Figure 1 - Project Location

Source: Map Copyrighted 1979 by the California State Automobile Association.
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North

TABLE 1
Project Characteristics

Proposed Land Uses (gross square feet)	Existing Church	Proposed Project	Total Site
• Developed Area (footprint)	7,700	19,450	27,150
• Landscaped Open Space a/ (rear and front yards)	10,300	18,450	28,750
• Common Open Space (excluding access and parking)	NA	61,700	61,700
• Access and Parking	NA	26,000	26,000
Total Site Area	18,000	125,600	143,600
Building Area (gross square feet)			
• Single Family Homes	NA	49,659	49,659
• Church	7,700	-	7,700
Total Building Area	7,700	49,659	57,359
Proposed On-Site Parking (number of spaces)			
• Garage	-	26	26
• On-Site (along access road)	40	7	47
Total On-Site Parking	40	33	73

a/ Rear yards (15,360 square feet) plus front yards (3,090 square feet) for 18,450 square feet.

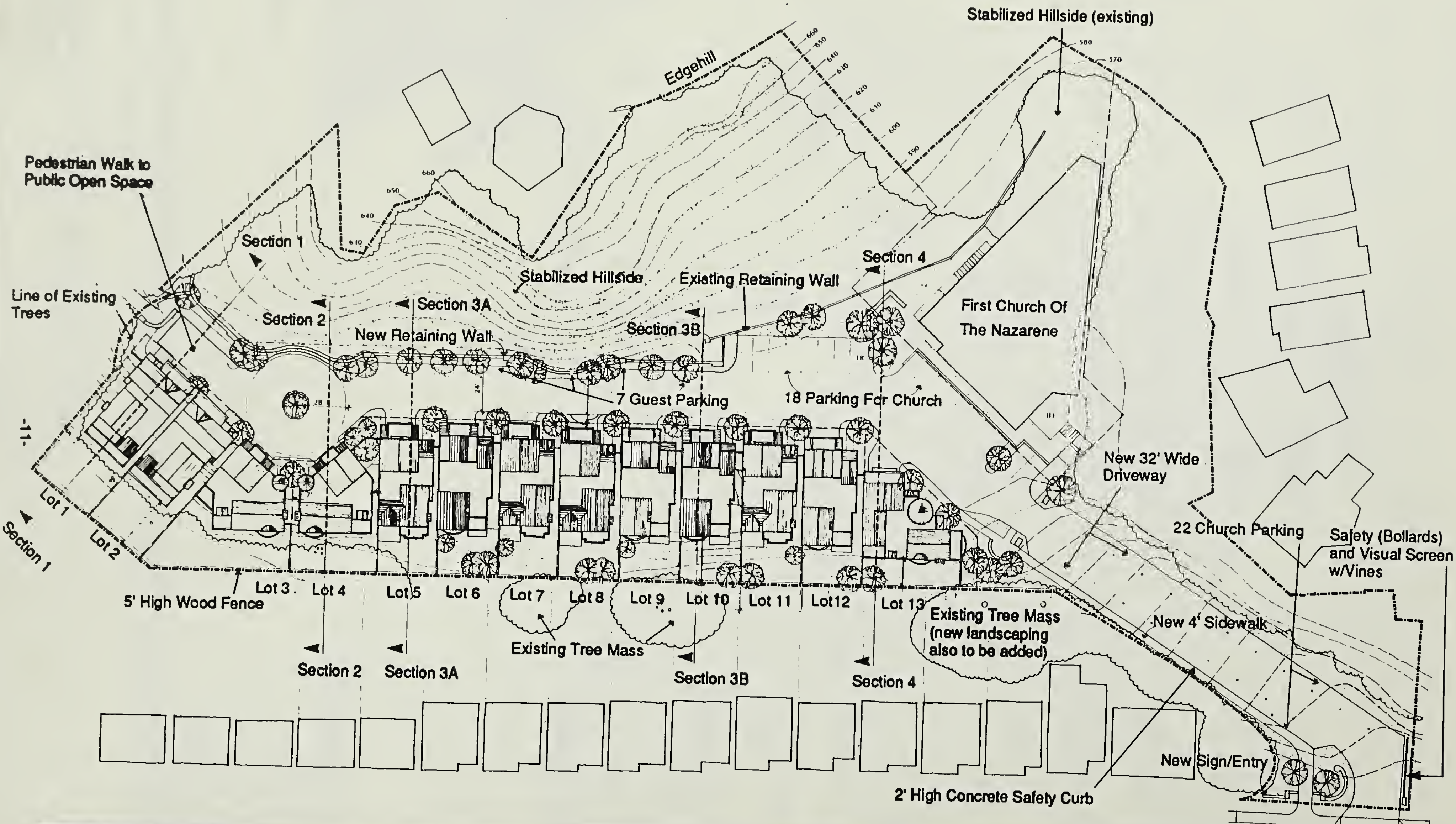


Figure 2 - Conceptual Site Plan -- Proposed Project

Section 1 - Section Orientation (see Figure 4 - Sections)

Source: Warner Schmalz, AIA, December 1989

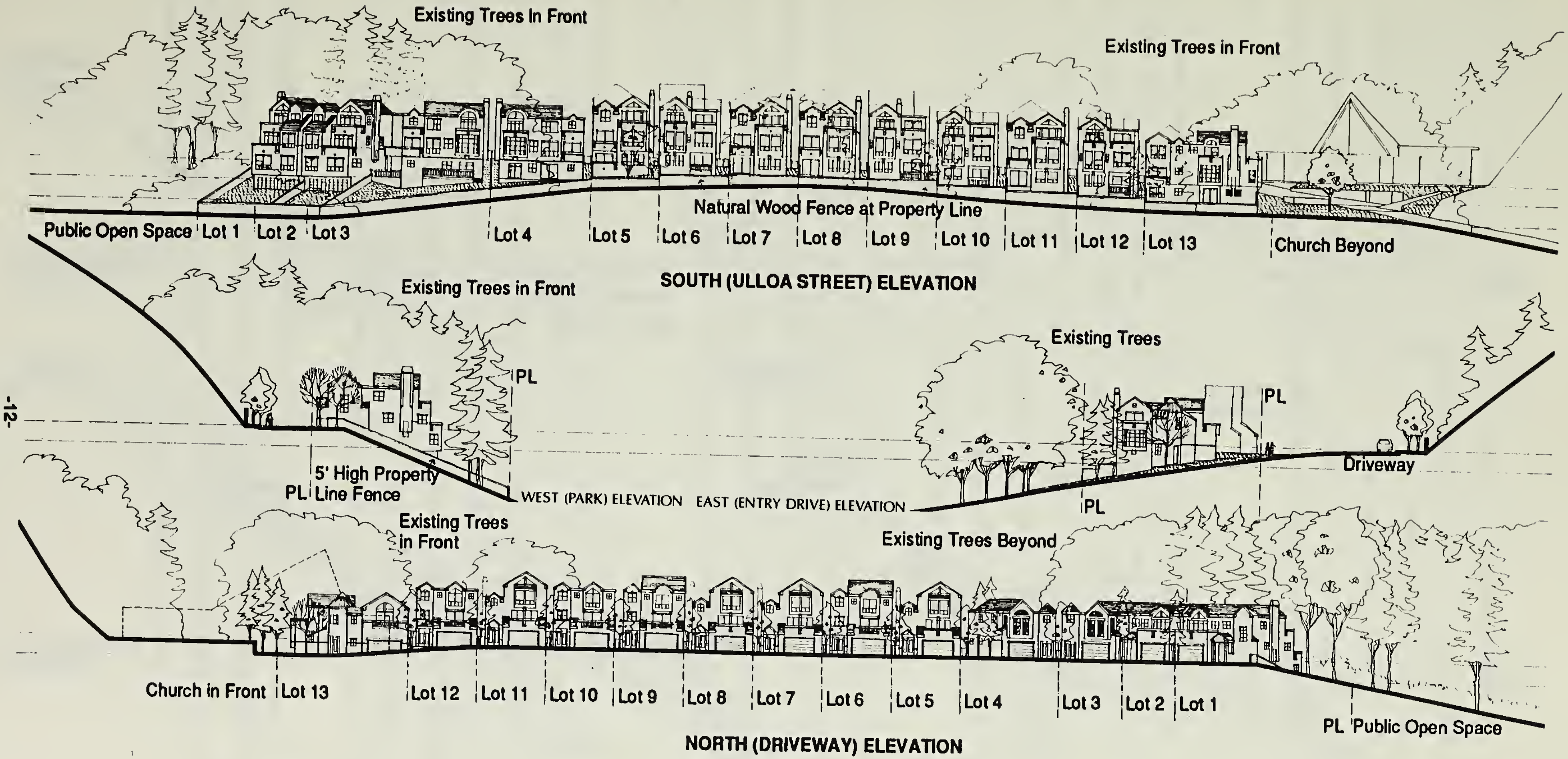
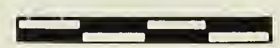


Figure 3 - Elevations



Source: Warner Schmalz, AIA, December 1989

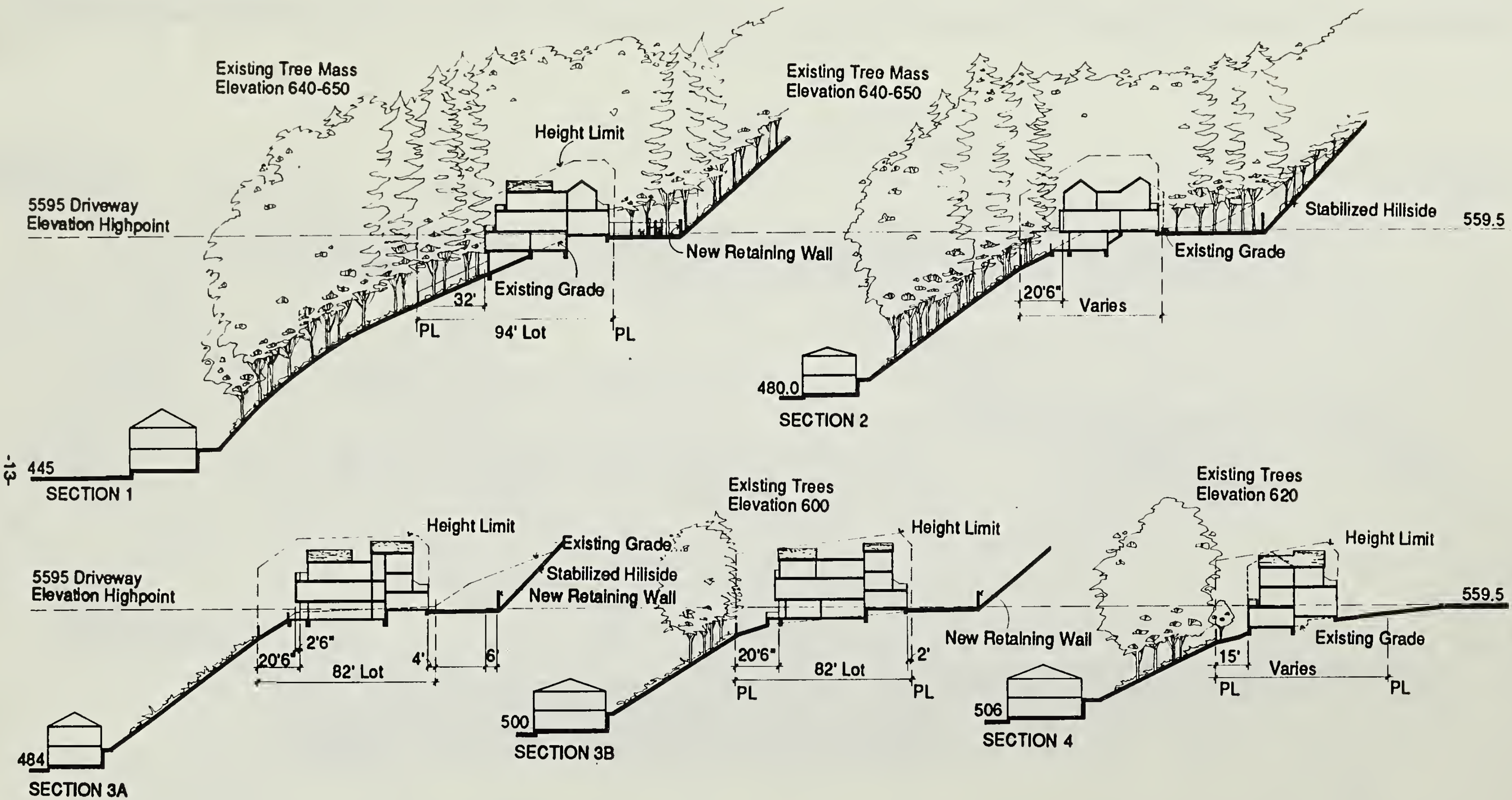


Figure 4 - Sections

See Figure 2, Page 11, Conceptual Site Plan, for Section Orientation

Source: Warner Schmalz, AIA, December 1989

After subdivision, the church would retain an 18,000-square foot lot. The remaining 125,600 square feet would be subdivided into 14 lots, 13 of which would be developed with single-family homes. Residential lots would be approximately 32 feet wide by 82 to 94 feet long, for an average lot size of about 2,923 square feet. Each residential lot would be developed with a single-family home of approximately 3,035 to 3,609 square feet with 4 to 5 bedrooms. The sponsor estimates that home prices would range from $650,000 to $750,000 per home and, based on an average of 4 persons per household, that the on-site population at project completion would be about 50 people.

The single-family homes would vary from approximately 21 to 35 feet in height and would be two or three stories at the front along the on-site access road and three stories at the rear, as viewed from Ulloa Street. Housing units would be set back about 34 feet from a hillside retaining wall, about 15 to 32 feet from the southern property line, and 10 feet from the western property line (see Figure 2, page **11**). Most units (11) would be built contiguous to their western property lines with no side yard setback. All 13 units would have minimum side yard setbacks from their eastern lot lines of 3.5 feet at the front of buildings and 6.0 feet at the rear. Each unit would have decks for usable private open space in addition to yards.

Total coverage by buildings would be approximately 19,450 square feet. There would be about 15,360 square feet of private open space, consisting of rear yards, plus another 3,090 square feet of landscaped open space in front yards. Dedicated common open space owned by the homeowners' association would cover approximately 87,700 square feet, including 26,000 square feet of access road and walkways. Total site development, excluding the church parcel, would result in 16% by buildings only, 36% coverage of the site by buildings and paved areas, and 64% of open space area.

Access to the existing church and proposed homes would be provided from Ulloa Street along the alignment of the existing driveway at the site which would be extended west as a private roadway, parallel to the toe of the hillside, ending in a cul-de-sac at the western site boundary. This main access road would be 32 feet wide with an effective width of 18 feet with parking on both sides; the portion of the access road in front of the proposed homes would vary from 17 to 24 feet with 7 parking spaces. A two-foot-high solid concrete safety curb would be built on the south side of the main access road, and a traffic barrier (bollard) would be placed at the foot of the driveway (on-site). Both are proposed to protect off-site properties from runaway vehicles.

Two off-street parking spaces would be provided in the garage of each unit, and seven on-street spaces would provided across from homes. An additional 40 on-site parking spaces would be provided for the church -- 18 spaces in a designated parking area and 22 spaces on the main access road. Excess church spaces would be available to project residents and guests when there are no church services or functions.

The project would alter the site's existing slopes by excavating about 4,500 cubic yards of rock and soil to stabilize the hillside. (Another approximately 1,500 cubic yards would be excavated for general site development, including utility trenches.) Slope stabilization would involve removing vegetation (including about 3 trees with diameters under 6 inches and 12 trees with diameters over six inches from the slope stabilization area), clearing loose and weak rocks (about 300 cubic yards), reshaping and stabilizing slopes, installing rock bolts, planting new landscaping, covering portions of the slope with wire mesh, and building a 5- to 12-foot high catchment wall at the final toe of the slope. These features of the project are described below. Stabilization measures are illustrated conceptually in sketches and photographs in Figures 5 through 11, pages 16-20 and 22-23; the locations where these measures are proposed to be implemented on the site are shown in plan (Figure 5, page 16) and elevation (Figure 6, page 17).

- <u>Remove Loose Rock Masses, Install Rock Bolts, Drape/Secure Wire Mesh</u> (Measure A, Figures 5 and 6, pages 16-17)

  Masses of rock which already have been weakened along pre-existing joint systems by the weathering process, accelerated locally by root action would be removed. A typical, weakened rock mass on the steep bluff in the central part of the site is shown in Figure 7-A, page 18. Loose blocks of rock would be removed, either mechanically or by hand, after which the remaining bluff would be stabilized by installing a pattern of rock bolts and wire mesh designed to anchor the rock mass to the hillside (see Figure 8, page 19). An example of this technique is visible on the slope behind the existing church at the eastern end of the site (see Figure 7-B, page 18). The rock bolting process would be expected to stabilize the steep rock bluff portion of the site and reduce to an acceptable level the potential for the sudden movement of large rock masses downslope. Incorporating wire mesh into the stabilization system would knit the entire rock-bolted zone together so that even if a block of rock were to dislodge, its movement would be restrained. Rock bolting is a conventional form of rock stabilization for slopes similar to those on the site and has been done on the site itself, as noted above.

- <u>Scale Slope of Loose Material</u> (Measure B, Figures 5 and 6, pages 16-17)

  This measure would involve removing boulders or rock masses which have been dislodged from the slope above the bench. The purpose of this measure would be to eliminate the likelihood that these rocks would roll downslope and damage the project buildings. One of the larger boulders on the site which already has been dislodged and is resting on the slope below the massive chert bluff is shown on Figure 9-A, page 20.

Legend:

A Remove Loose Rock Masses, Install Rock Bolts
B Scale Slope of Loose Material
C Flatten or Shape Crest of Slope
D Drape Slope with Wire Mesh Secured to Slope
E Construct Catchment Wall

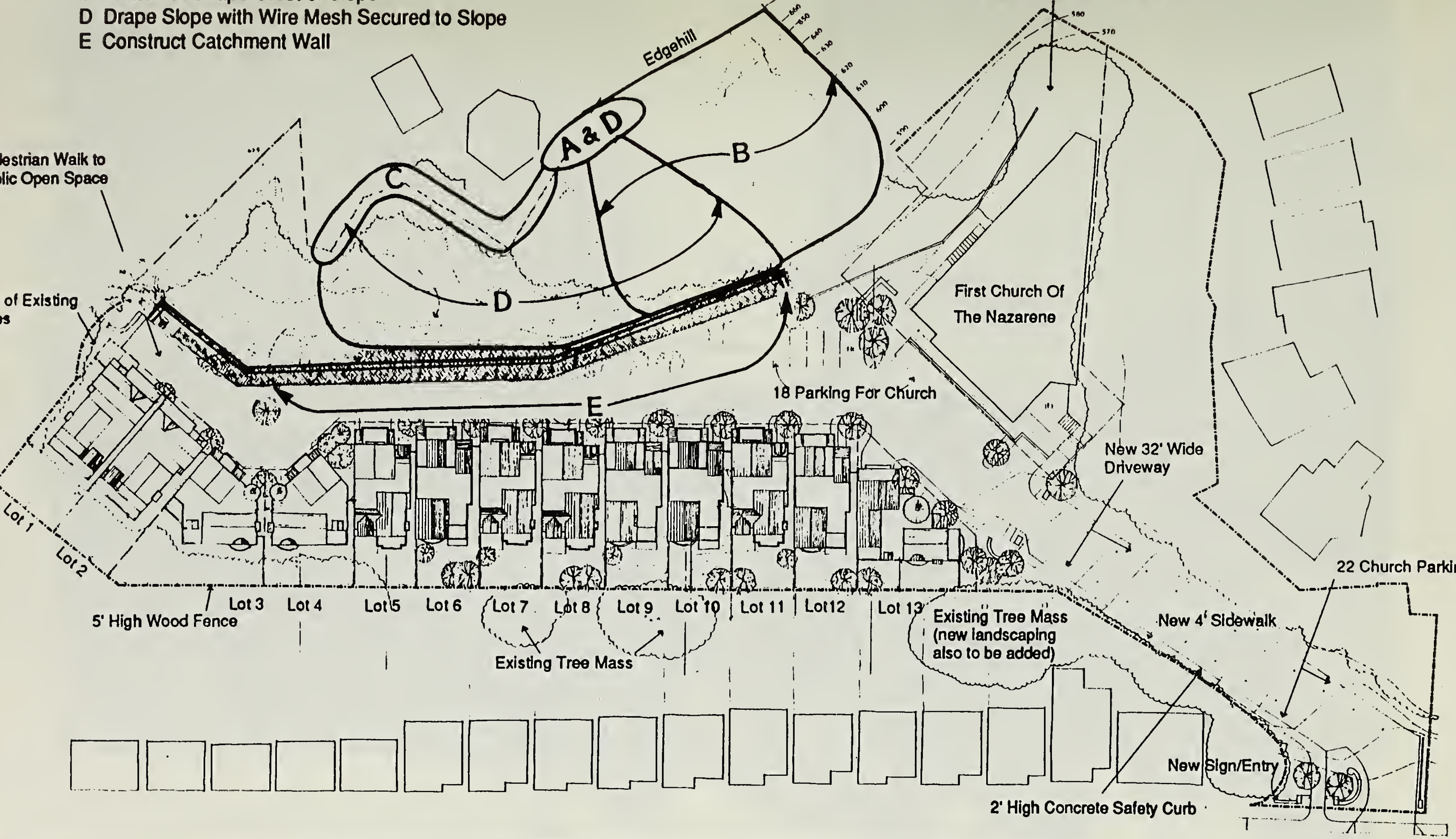


Figure 5 - Site Plan -- Slope Stabilization Areas

Source: Dames and Moore, January 1989

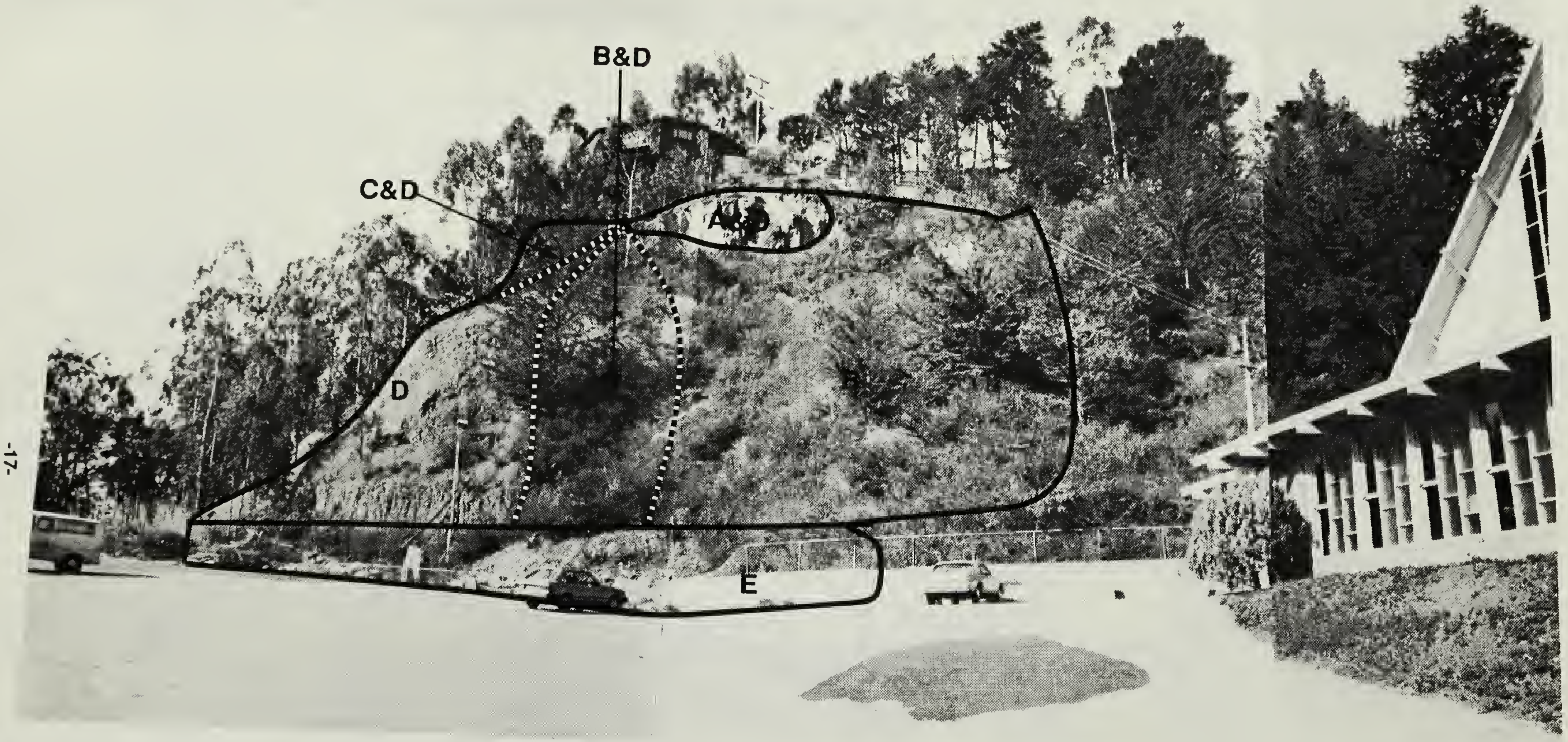


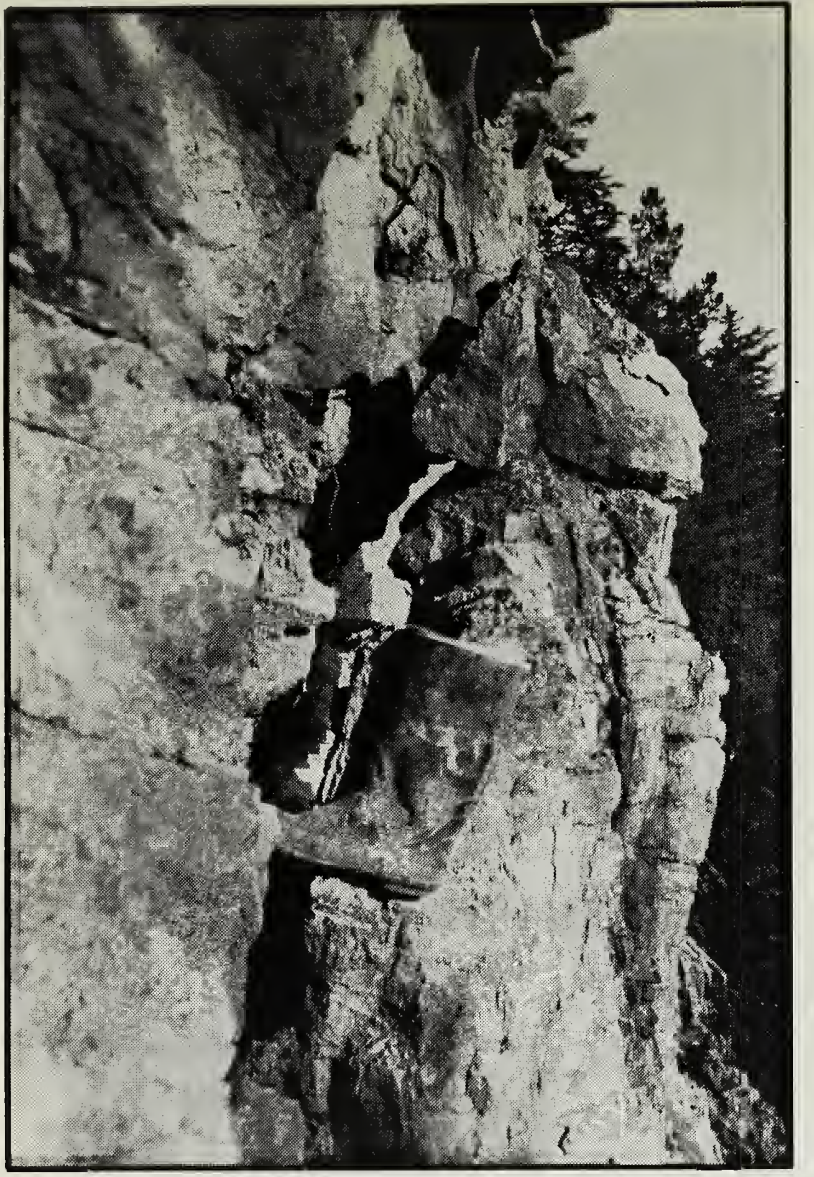
Figure 6 - Photograph -- Site Stabilization Areas

Partial Northwest View of the Slope to be Stabilized with Outlined Areas Showing Location of Various Stabilization Measures.

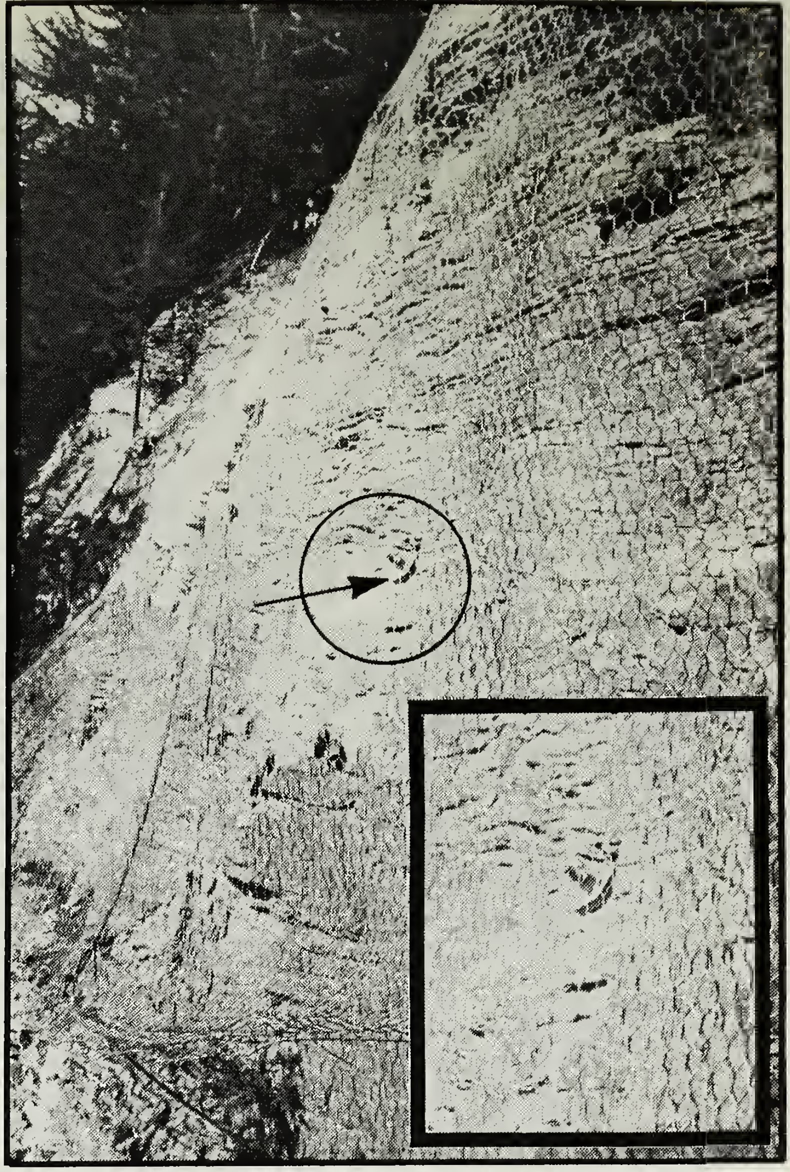
Legend:

A Remove Loose Rock Masses, Install Rock Bolts
B Scale Slope of Loose Material
C Flatten or Shape Crest of Slope
D Drape Slope with Wire Mesh Secured to Slope
E Construct Catchment Wall

Source: Dames and Moore, January 1989



7A Unstable rock mass of massive chert bedrock along steep bluffs above the central part of the site (boot in center of photo provided for scale).



7B Existing Rock Bolt (shown at arrow) and wire mesh system behind the church structure at the eastern end of the project property.

Figure 7 - Photograph -- (A) Unstable Rock Mass and (B) Rock Bolt and Wire Mesh

Source: Dames and Moore, January 1989

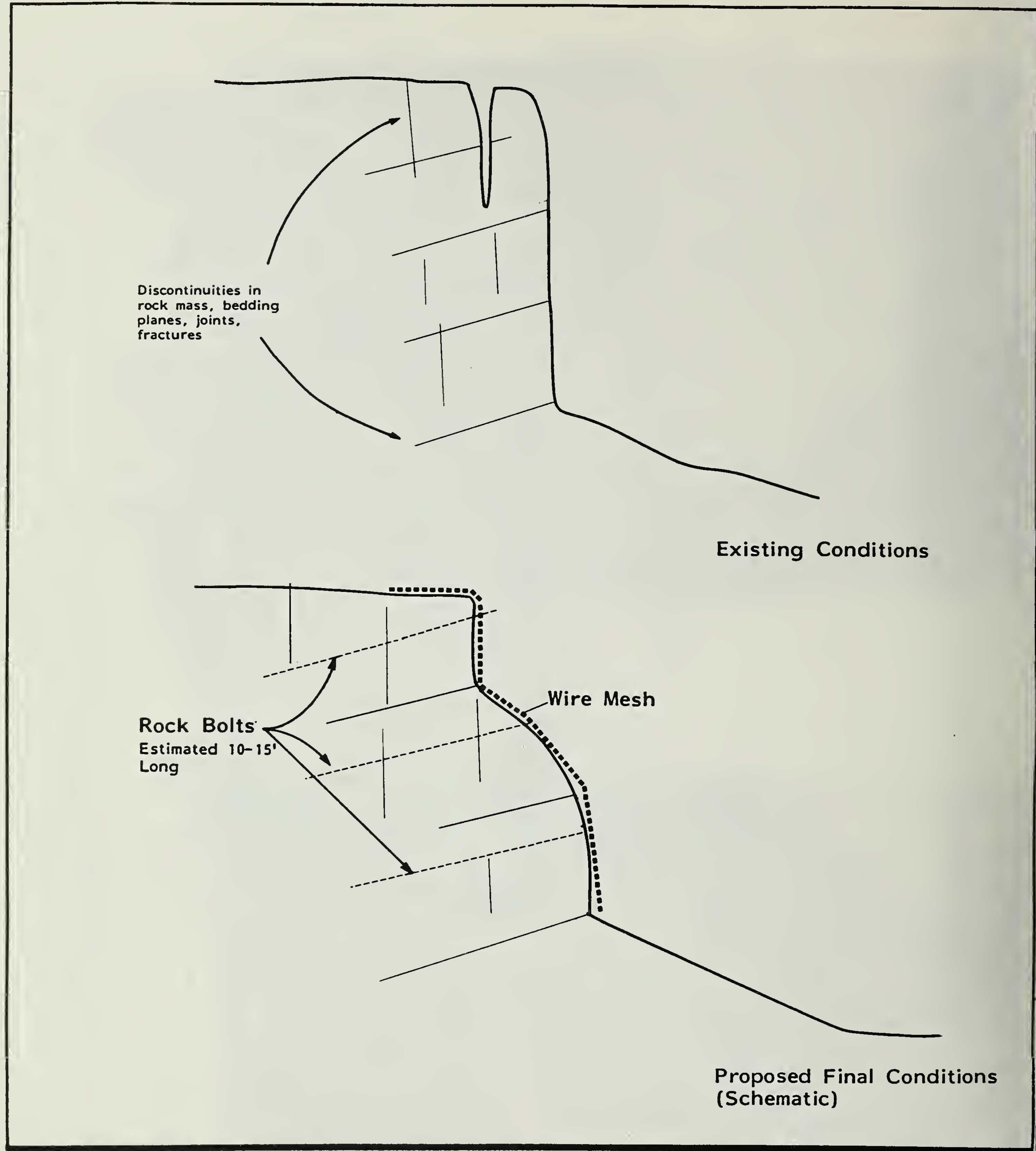
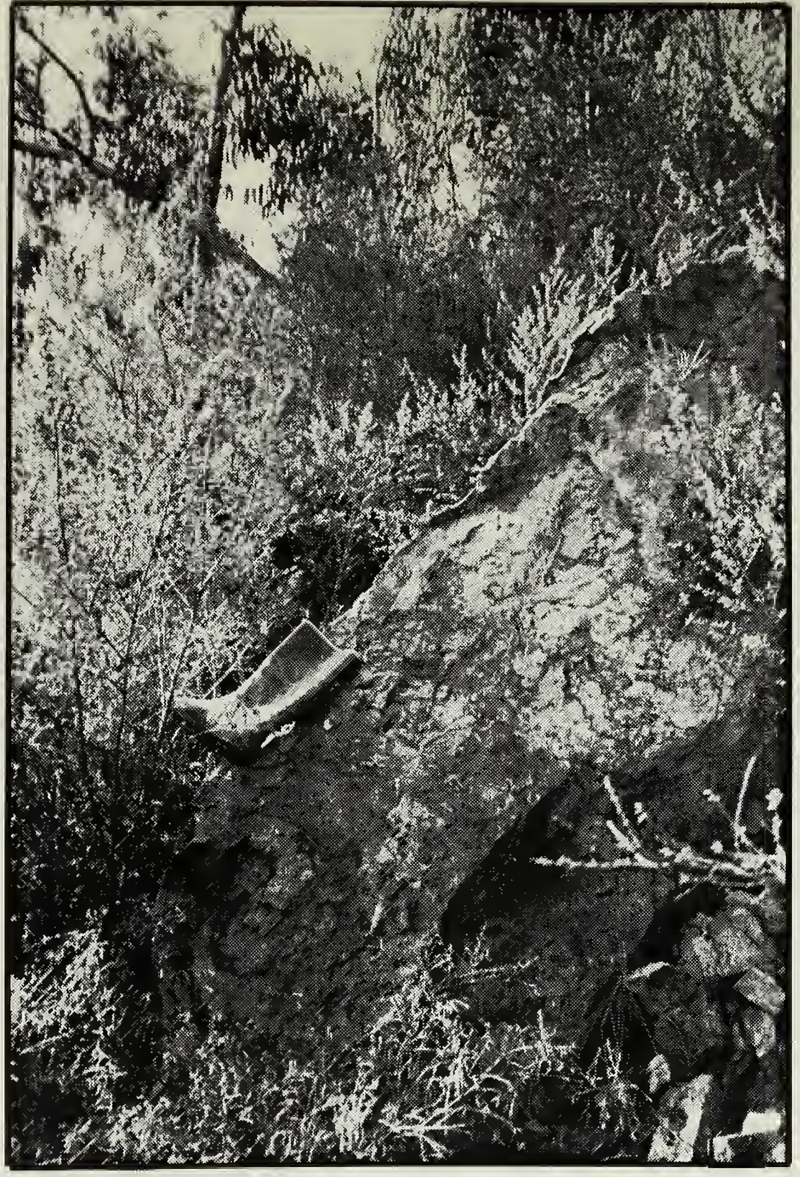


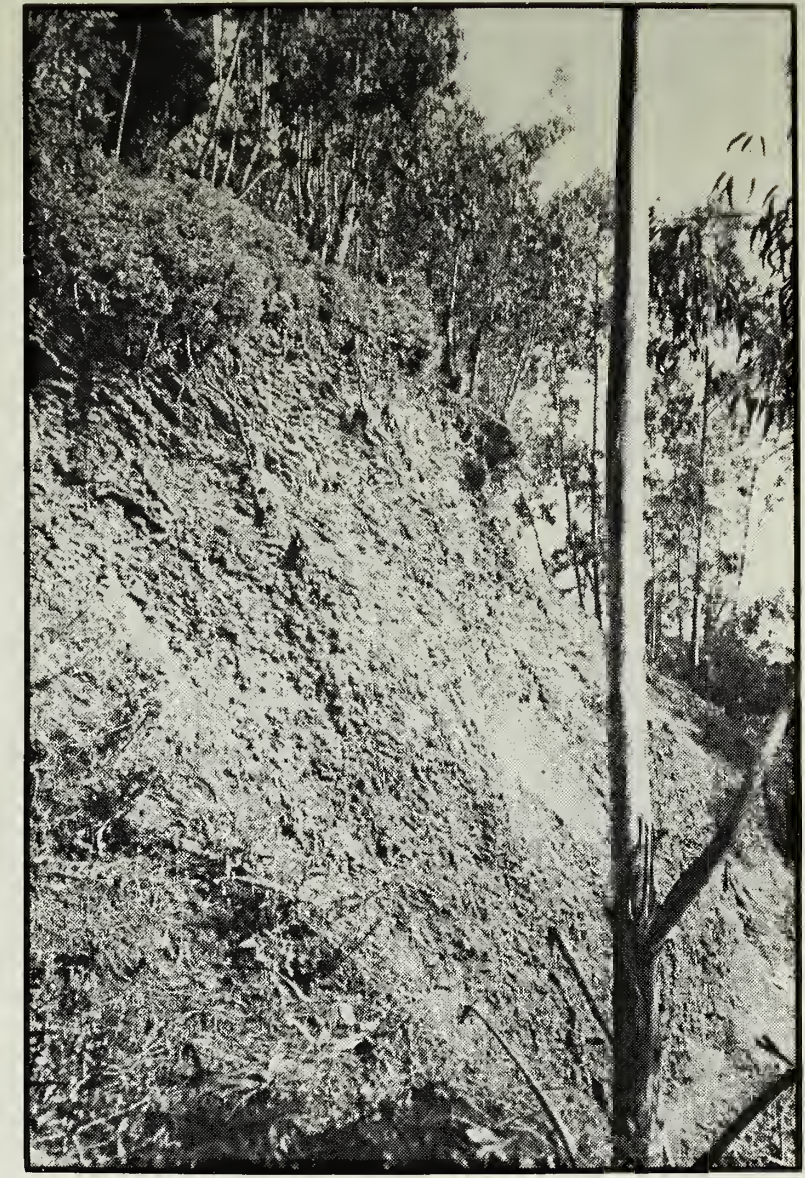
Figure 8 - Schematic Illustration -- Remove Loose Rock Masses and Install Rock Bolts

Source: Dames and Moore

Not to Scale



9A Boulder that has already been dislodged from the massive chert bluff (boot provided in photo for scale).



9B Near-vertical slope at the top of exposed thinly bedded chert in the western portion of the site.

Figure 9 - Photograph -- (A) Large Dislodged Boulder and (B) Near Vertical Slope

Source: Dames and Moore, January 1989

- Flatten or Shape Crest of Slope (Measure C, Figures 5 and 6, pages 16-17)

  Certain areas of the site, particularly the western portion, contain zones where overburden soils, weathered rock, and vegetation are relatively steep or actually overhang the underlying cut slope. These zones are susceptible to progressive failure which would result in an accumulation of soil and rock debris at the toe of the slope. In order to minimize the potential impacts of this phenomenon and reduce long-term maintenance requirements, the slope crest would be "shaped", either mechanically or by hand, to a more stable configuration. This work would extend onto adjoining property uphill from the site, subject to the owner's agreement, or could be confined to the site. Figure 9-B, page 20, shows existing conditions; Figure 10, page 22 illustrates existing and final conditions schematically.

- Drape Slope with Wire Mesh Secured to Slope (Measure D, Figures 5 and 6, pages 16-17)

  This measure would be used locally for two conditions in order to reduce the impacts of continued slope degradation:

  -- Over steep slopes of thinly bedded chert in the western portion of the site. The presence of mesh would retard the effects of raveling or sloughing of the weathered rock mantle and provide a support system for vegetation, such as vines, proposed to be planted as landscaping.

  -- Over the steep, massive chert bluffs in the central part of the site. The presence of the mesh would restrain dislodged blocks of rock and prevent them from suddenly rolling downhill.

  These two options are illustrated schematically in cross section form in Figure 11, page 23, and an example of this stabilization technique (behind the existing church) is shown in Figure 7-B, page 18.

- Construct Catchment Wall (Measure E, Figures 5 and 6, pages 16-17)

  The proposed project would include construction of a five- to twelve-foot high catchment wall at the toe of the reconfigured slope to protect the developed area from slope ravelling/sloughing or rockfall. A reinforced, concrete catchment wall at the toe of the slope would back up the project's other stabilization techniques by providing an additional measure to reduce the impacts from slope failures. Proposed residences would be set back a minimum of 34 feet southeast of the wall.

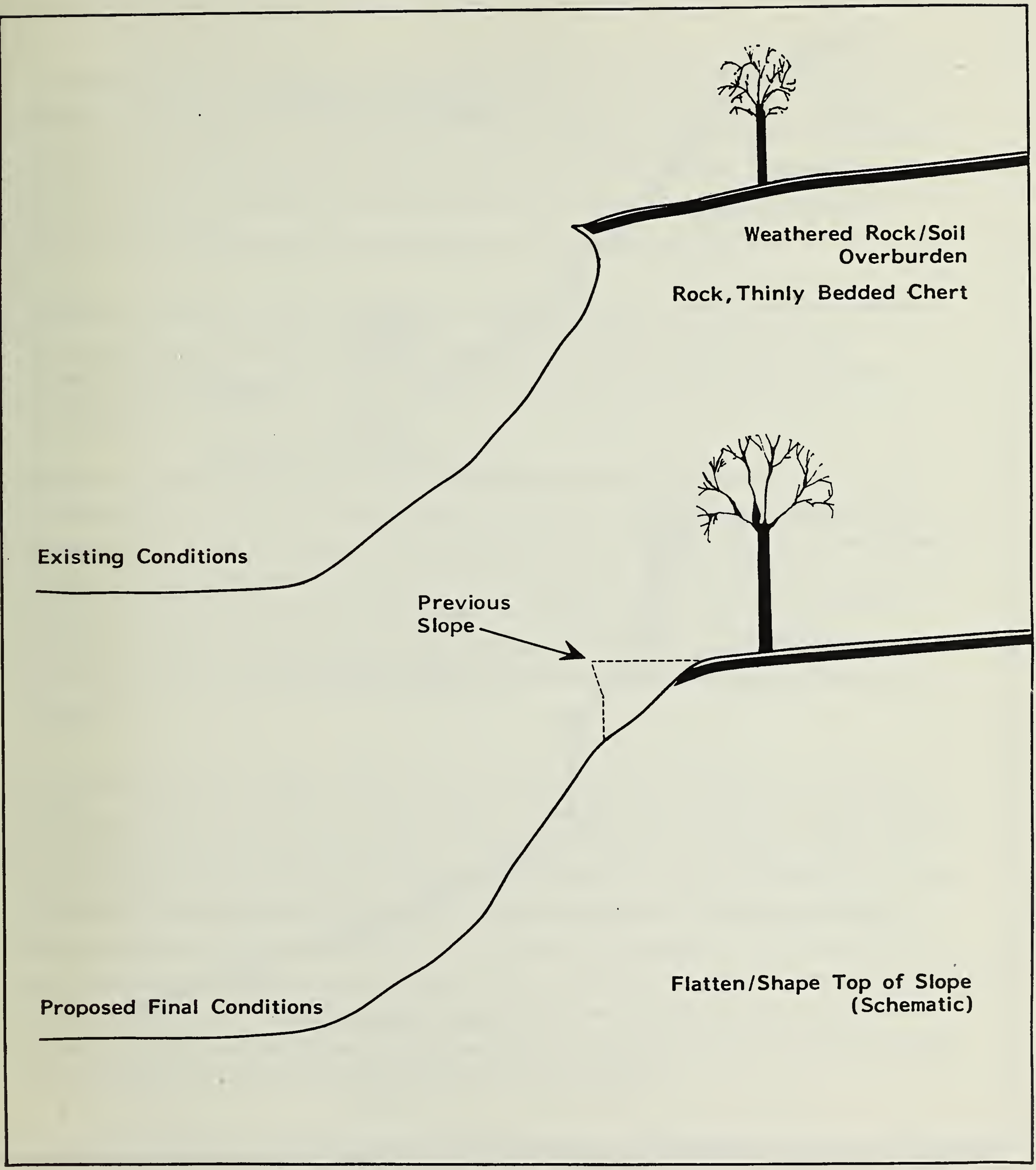


Figure 10 - Schematic Sketch
- Weathered Rock/Soil Overburden and Flatten/Reshape Top of Slope

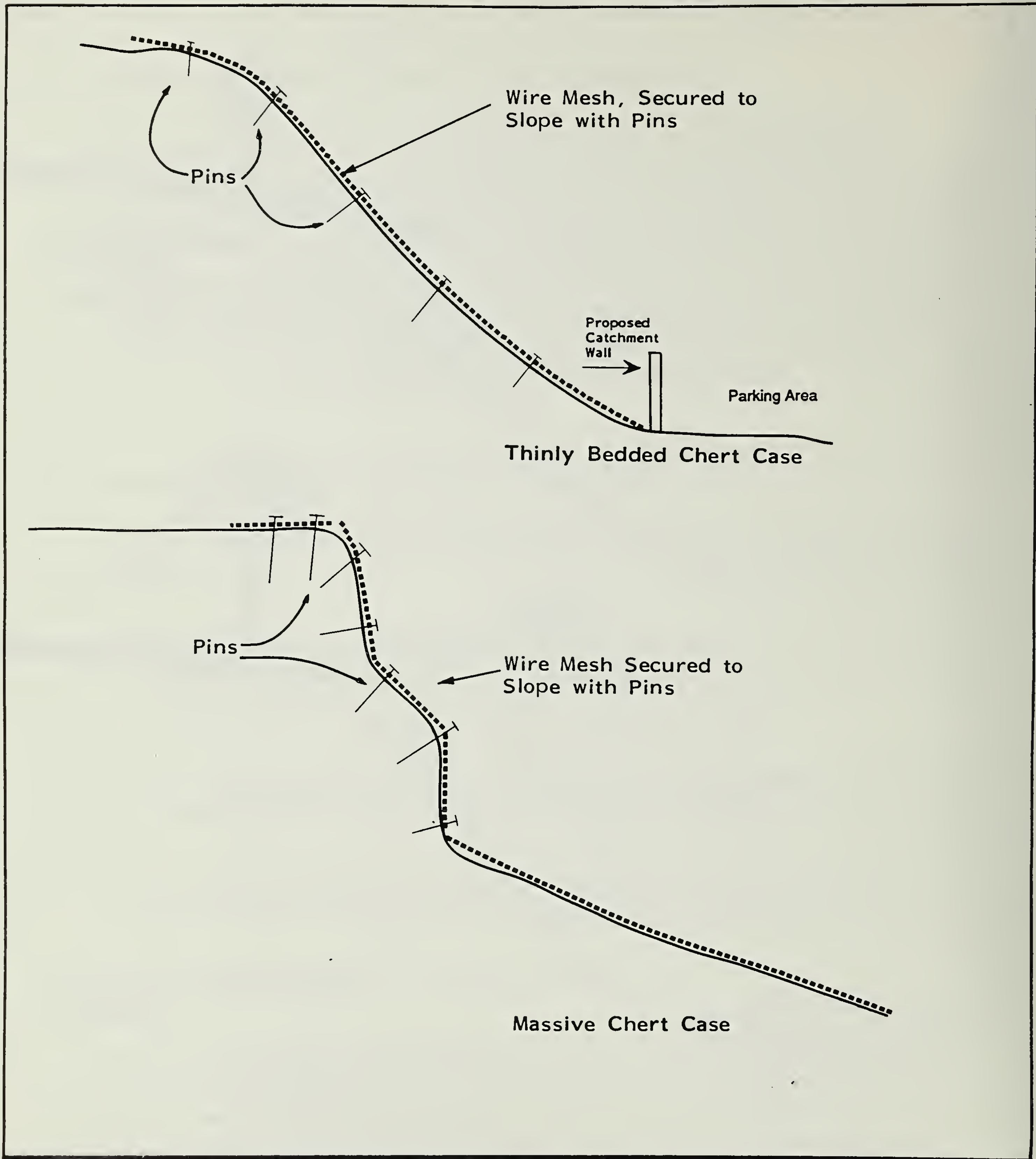


Figure 11 - Schematic Sketch -- Drape With Wire Mesh

Source: Dames and Moore

Not to Scale

The sponsor may contract separately for slope stabilization and project construction. Implementation would be phased to complete slope stabilization and construction of the proposed catchment wall first, followed by construction of the buildings. A long-term program to maintain the stabilized slopes would be established by the sponsor as part of the project and would include periodic inspections of stabilized areas, removal of debris accumulated behind the wall, and regular inspection (and clearing, as needed) of drainageways. Maintenance of this program would be the responsibility of the homeowners' association.

According to the sponsor, all earth material would be excavated using conventional construction equipment without blasting, and neither slope stabilization nor site excavation would require blasting. Project buildings would be lightly-loaded (i.e., the weight of the buildings would not be so great as to jeopardize slope stability). [1]

A total of 112 trees would be removed (15 from the stabilized slope and 97 from proposed Lots 1, 2, 3, and 4) at the southwestern portion of the site (as shown in Figure 2, page 11). Vegetation would be planted on the site both to stabilize the slope and augment existing vegetation. New landscaping would include fire-retardant shrubbery and trees behind the catchment wall near the toe of the slope, evergreen vines on the slopes which extend uphill to Edgehill Way, behind the project, and 112 new trees. Of those, about six trees would be planted and irrigated off-site, south of the property line fence; the project sponsor would need formal authorization from the adjacent residents to plant trees on their lots (the affected homeowners have agreed in concept). [2]

The project would alter an existing sewer line which crosses the site from north to south in an easement; the project would accommodate flows in the proposed sewer facilities and would maintain part and abandon the rest of the easement, as follows. The existing sewer and easement serving 301 and 305 Edgehill Way would be maintained as far downhill as the site access road where the existing sewer would be connected to a new sewer proposed to be installed in the site access road. The remaining segment of the existing sewer continues downhill across the site to the rear yards of 432, 444, and 452 Ulloa and proceeds to Ulloa Street through the side yard of 452 Ulloa Street; that segment of sewer and the easement downhill from the proposed new connection would be abandoned after the project is completed. The existing sewer is private; thus, the project sponsor would need formal authorization to abandon the easement from the residents of 432, 444, and 452 Ulloa Street (the homeowners have agreed in concept) but would not need City approval.

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1 Letter from Ray Rice and Joseph Jeno, Dames & Moore, to Reverend Fred Forster, First Church of the Nazarene, November 4, 1987.

2 Conversations of Warner Schmalz and Emery Rogers (applicant's architect and landscape architect, respectively) with Greater West Portal Neighborhood Association Steering Committee and several individual neighbors at various meetings in 1988, 1989, and 1990.

Surface runoff would be collected and conveyed to City drainage facilities, including from the rear yards of proposed Lots 4 through 13 where a 4-inch storm drain would be installed to intercept and divert flows from reaching the rear yards of adjacent Ulloa Street homes.

The site would be connected to City water lines for all domestic and fire fighting requirements. [3]

A temporary construction fence would be placed along the southern property line, and a new, wooden property line fence would be built upon project completion.

D. PROJECT APPROVALS, SCHEDULE, AND COSTS

APPROVALS

Following a public hearing on this Draft EIR before the City Planning Commission, responses to written and oral comments will be prepared; this EIR will be revised as appropriate and presented to the City Planning Commission for certification as to accuracy, objectivity, and completeness. No permits may be issued before the Final EIR is certified.

The project is proposed as a Planned Unit Development (PUD) under Section 304 of the City Planning Code. Consideration of a project as a PUD is permitted for sites greater than one-half acre in size. According to Section 304(a):

> The procedures for Planned Unit Developments are intended for projects on sides of considerable size, developed as integrated units and designed to produce an environment of stable and desirable character which will benefit the occupants, the neighborhood and the City as a whole, In cases of outstanding overall design, complementary to the design and values of the surrounding area, such a project may merit a well reasoned modification of certain of the provisions contained elsewhere in this Code.

Under Section 304, the project sponsor will be requesting City Planning Commission approval for modification of the lot size, side yard, and rear yard requirements as part of the PUD. Planned Unit Developments require conditional use authorization from the City Planning Commission pursuant to Section 303 of the City Planning Code. In addition, the project would require findings by the City Planning Commission that it complies with the requirements of Section 101.1 of the City Planning Code (Proposition M).

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3 Letters from the Water Department and Fire Department, confirming that pressure in City lines would be adequate to serve the project, are on file with the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

The project would require subdivision of the site into 15 lots: one for the existing church, one for a common private roadway and open space, and 13 to be developed as single-family dwellings. The project would then require building permits for construction of the residences.

PROJECT SCHEDULE AND COSTS

After approval and issuance of building permits, construction would proceed in two phases with completion expected in 14 months. The church would remain in use throughout the construction period. The estimated duration of each activity would be as follows: hillside stabilization, 4 months, and site improvement and home construction, 10 months, for a total of 14 months. The project is planned to be completed and occupied in 1992. The estimated construction cost for the 13 homes, landscaping, and on-site improvements is about $4,400,000 (1990 dollars), including about $644,000 for slope stabilization.

IV. ENVIRONMENTAL SETTING

The site is located about 110 to 130 feet north of Ulloa Street, except for a 90-foot wide street frontage in the southeast corner where the site's driveway connects with Ulloa Street. The site's northern boundary abuts Edgehill Way, also for about 90 feet, but no vehicular access is provided. Within the site, a 60- to 100-foot deep, 300-foot long bench has been cut across the quarry face in an east-west direction. The bench's elevation is approximately 550 to 560 feet above sea level, and the hillside rises 115 to 125 feet behind the bench, almost vertically in some areas, to an uppermost site elevation of 675 feet at Edgehill Way. The eastern part of this bench was developed in 1960 with the existing 7,700-square foot church building and about ten designated parking spaces. The western part of the bench is vacant; it was used until March, 1983 as a children's play area. The proposed single-family homes would be built on the western part of the bench.

The site is surrounded by single-family residential development on the north, east, and south and abuts tree-covered public open space on the west. It faces Mount Davidson to the south. Other nearby uses include St. Brendan's Church and School, one block east of the site on Ulloa Street, and the West Portal Neighborhood Commercial District, about five blocks west of the site. Portola Drive, a major east-west thoroughfare, is located on block south of the site.

A. GEOLOGY

PREVIOUS STUDIES [4]

Studies of the site's geologic and geotechnical characteristics have been performed during the past 30 years by different consultants who have evaluated the site for sponsors of various development proposals. Among these consultants are Don Hillebrandt Associates and Dames & Moore who have also most recently assessed existing conditions at the site as well as future conditions with development. Their views of the nature of site instability and recommendations for stabilization differ to some extent.

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4 The reports which have been prepared for this and prior development proposals are available for review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

Don Hillebrandt Associates

Since 1981, this consultant has conducted several geotechnical engineering investigations at the site, including two reconnaissances of the steeply-sloped hillside and a subsurface exploration program involving ten test borings on the bench. In June, 1981, a report was prepared for a proposed condominium project. [5] The report described geotechnical conditions, qualitatively evaluated where development should be located on the site in relation to the existing slopes, and identified stabilization measures recommended for that project. Between 1985 and 1987, consulting services were provided to the First Church of the Nazarene concerning the feasibility of stabilizing the hillside and the suitability of the bench area for development. The initial phase of work involved stabilization behind the church building. The second phase involved reviewing stabilization plans for the remaining slope. [6] More recently, Mr. Hillebrandt served as a paid geotechnical consultant to some neighbors (Ulloa Street Neighborhood Group Opposed to the Proposed Project at 300 Ulloa Street) to evaluate the previously proposed project for the site. [7]

Dames & Moore

This consultant has been involved in examining the site's geotechnical conditions and making slope stabilization recommendations since 1956, prior to the construction of the existing church. A slope hazards investigation was conducted for the church in 1978, but the recommended stabilization measures were not subsequently implemented. [8] A supplementary report was prepared in 1979 which outlined a modified program to minimize the effects of possible future rockfalls, but the stabilization measures recommended in that report were not subsequently implemented. [9]

This consultant has been employed by the present project sponsor since 1987 when the firm mapped the hillside portion of the site in detail. That work involved traversing the slope, measuring the orientation of bedding and joint planes, and photographing and documenting site features. Another consultant, KCA Engineers, Inc., surveyed the site in February, 1988 for the project sponsor and prepared a topographic map of the area of the

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5 Preliminary Geotechnical Investigation, Don Hillebrandt Associates, June, 1981.

6 Geotechnical Engineering Consultation, Don Hillebrandt Associates, September, 1987.

7 That project was a 120-unit residential care facility. Telephone conversation between Louise Nichols and Don Hillebrandt, February 13, 1990, and letter of Donald H. Hillebrandt to Elbert Wilson, Jr. (Neighborhood Action Coordinator, Opposition to the 300 Ulloa Project Neighborhood Group), June 7, 1988.

8 Slope Hazards Investigation, First Church of the Nazarene, Dames & Moore, August, 1978.

9 Supplementary Report, Slope Hazards Investigation, First Church of the Nazarene, Dames & Moore, October, 1979.

slope which Dames & Moore identified as requiring detailed mapping. Dames & Moore has provided geotechnical input for the environmental documents prepared for the project by the Office of Environmental Review.

TOPOGRAPHY

The project site is a former rock quarry and is located on a southeastern-facing slope of Edgehill Mountain, northwest of Mount Davidson. It contains several major topographic features:

- An essentially flat bench, measuring approximately 60 to 100 feet deep and 300 feet long, which has been cut across the quarry face in an east-west direction. Its elevation is about 550 to 560 feet above sea level.
- A steeply-cut slope, the former quarry face, which rises about 115 to 125 feet above the bench to an uppermost site elevation of 675 feet at Edgehill Way. Overall slopes range from 1:1 to 1.5:1 (horizontal to vertical).
- A prominent bedrock exposure in the approximate center of the slope which is about 20 to 30 feet high and is almost vertical in places.
- A bowl-shaped depression in the cut slope near the western end of the site which reflects a combination of quarrying activity and shallow slope failure.

GEOLOGY

Bedrock

The site is underlain by chert bedrock of the Franciscan Assemblage which occurs in two forms:

- Thinly-bedded, with beds typically two to three inches thick and separated by thin shale interbeds. This chert usually is dark red in color.
- A more massive variety which forms the prominent outcrop observed in the upper elevation of the central part of the site (see Figure 12, page 30). This chert appears to be lighter, typically cream-colored or grayish.

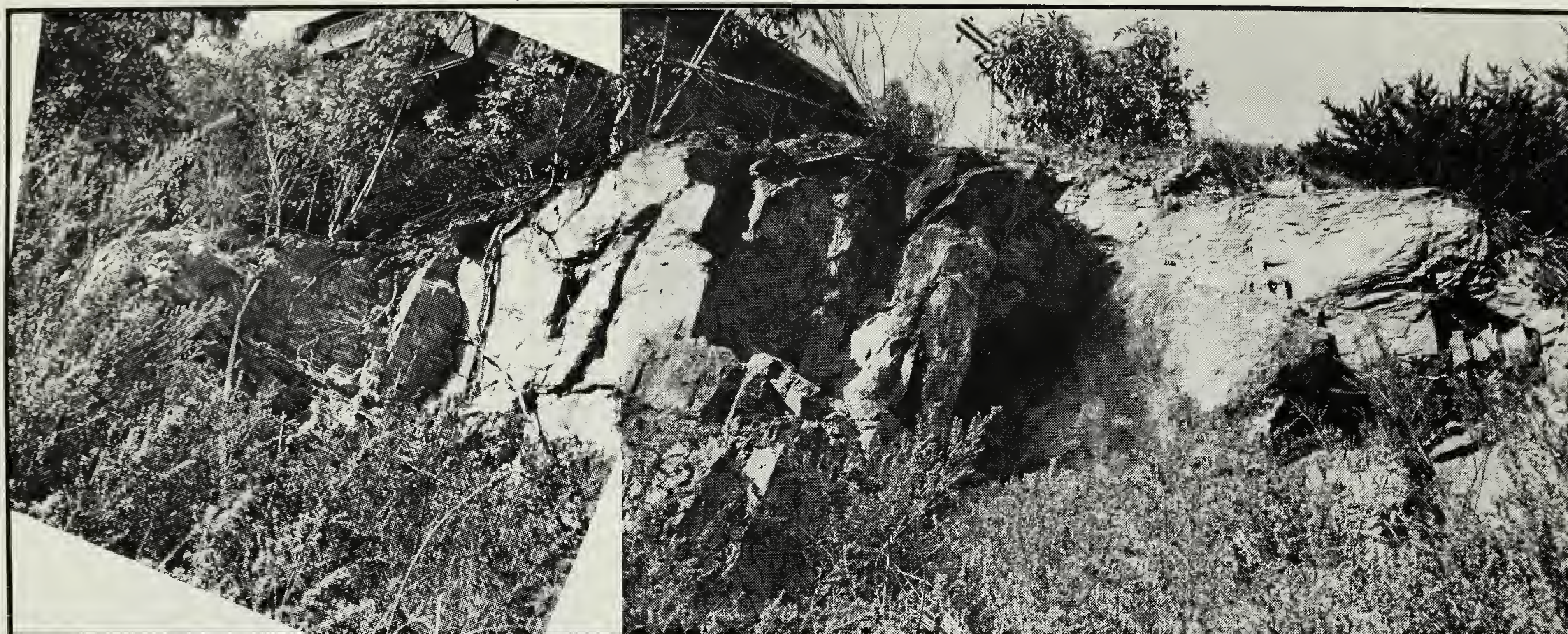

Figure 12 - Massive Chert

Prominent Outcrop of Massive Chert Bedrock in the Upper Part of the Central Portion of the Site.

Source: Dames and Moore, January 1989

Scale is about 1" = 5'

The bedrock has been folded and faulted and is jointed, especially the thin-bedded sections. Bedding generally strikes northwest to southeast and dips from 20 to 40 degrees northeasterly.

The ten test borings drilled by Don Hillebrandt Associates during subsurface exploration of the bench in 1981 reached depths of 21 to 48 feet. [10] The borings indicated that most of the level bench is cut in bedrock and that fill and overburden soil lie on top of the bedrock in some areas. Three of the test borings located near the southern edge of the bench encountered fill and/or overburden material depths ranging between four and sixteen feet.

Areas of Slope Instability

Since the church was built in 1960, portions of the site have been affected by landslides and rockfalls. Slope instability at the site occurs in two forms:

- Accumulation of fine-grained debris by sloughing of thinly-bedded chert and its weathered soil overburden.

- Rockfalls of the massive variety of chert bedrock from the steep bluffs above the central part of the site.

The raveling type of movement can occur either gradually, as part of the normal weathering process, or more rapidly, particularly during periods of intense rainfall, such as during the heavy storms of January 1982, or as the result of moderate to strong ground shaking from an earthquake, for example, the period of seismic activity in October, 1989. The end product of this raveling is the fan-shaped accumulation of soil and rock debris which has formed an "apron" at the toe of much of the existing slope. Raveling slope movement can result in nuisances and require long-term maintenance rather than endangering life or safety. Rockfalls, consisting of large masses of up to tens of cubic yards, can occur suddenly and without warning, particularly during periods of heavy rainfall and/or major seismic events. Such movements can damage or threaten structures and human safety.

The site is in an area which has been designated as a Special Geologic Study Area in the Community Safety Element of the San Francisco Master Plan because of the possibility of landslide activity. Two large rockfalls are known to have occurred since the church was built in 1960. One originated northwest of the church building

[10] Geotechnical Engineering Consultation, Don Hillebrandt Associates, September, 1987.

in 1967; the second occurred in the central part of the site (near the former nursery school play area) in 1978.

According to Donald Hillebrandt, the "major geotechnical consideration in the development of the site is the potential for slide activity (rockfalls and sloughing/raveling)". [11] The steeply-sloping hillside has a history of stability problems, and there is a high potential for large rockfalls/slides in the future. Rockfalls could involve "large blocks of rock that are 5 to 10 tons in size. [When such] blocks fall down the hillside they [would] most likely break into smaller pieces, but rocks several cubic yards or more in size could reach the graded bench area." [12] A cubic yard of rock weighs an estimated 3,000 to 4,000 pounds. [13]

Rockfalls have originated at the massive chert bluff located in the center of the slope, and raveling of the thinly bedded chert and soil overburden has occurred in the western part of the site. [14] Roots of the eucalyptus trees growing on the western part of the slope are accelerating rockfall activity by wedging free the thinly-bedded chert. Other vegetation, where present, can catch or slow down falling rocks; when vegetation is sparse, rocks can reach the foot of the slope. Except for several boulders, the material below the massive chert outcrop appears to have reached a stable condition; the potential for continual slope failure exists at the massive chert outcrop. Altogether, "portions of the existing slopes uphill of the proposed development are marginally stable". [15]

The presence of trees and other vegetation can have a detrimental as well as beneficial effect on slope stability, depending upon local conditions. For example, as can be noted on the rock cliffs of the site, trees such as eucalyptus and cypress can contribute to rockfalls by the wedging action induced by their root systems as they grow into existing fractures in the rock mass. On the other hand, vegetation established on predominantly soil and weathered rock slopes typically tends to increase slope stability by "knitting" together the slope materials. In addition, trees have more "wind sail" than shrubs, causing virtually continuous movement of trunks and roots. In loose, weathered rock masses, existing trees contribute to rock fall and are themselves in danger of toppling. As discussed in Chapter III, Project Description, according to Dames & Moore, the project would remove trees from areas where they are contributing to slope instability and plant

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11 Preliminary Geotechnical Investigation, Don Hillebrandt Associates, June, 1981.

12 Ibid.

13 Letter of Henry J. Degenkolb To Whom It May Concern, May 16, 1988.

14 300 Ulloa Street Residential Care Facility EIR Response to Comments, Dames & Moore, January 26, 1990.

15 Letter of Joseph J. Jeno and John R. Theissen, Dames & Moore, to Ivan Christie, Office of Environmental Review, Department of City Planning, June 7, 1988.

vegetation in locations where needed to stabilize slopes in addition to planting vegetation as ornamental landscaping.

Rockfalls and landslides would be expected to occur in the future, and development of the site would need to take both types of geologic hazards into account. Without implementing slope stabilization measures, landslides could harm people or property. In addition, site development without stabilization of the slope could increase slope instability; excavation or construction on the site's existing slopes under such circumstances could affect the safety of people on the site.

Geotechnical consultants agree on the site's instability, that semi-stable to unstable conditions will persist, and that potential threats to property will remain unless slope stabilization measures are implemented. There is disagreement on whether slope instability is associated with shallow or deep-seated geologic conditions, the level of site investigation required to develop stabilization strategies, and the details and costs of appropriate stabilization measures. This disagreement is discussed in Chapter V, Environmental Impacts, page 48.

REGIONAL SEISMICITY AND FAULT ACTIVITY

The closest active faults to the site are the San Andreas Fault, about 4.5 miles to the southwest, and the Hayward and Calaveras Faults, about 14 and 26 miles to the northeast, respectively. All three faults are capable of large magnitude earthquakes (Richter magnitude (M) 7.0 or greater). The maximum predicted earthquake on the San Andreas Fault is M 8.3 (the same as the maximum historic earthquake). [16] The maximum predicted earthquake on the Hayward Fault is M 7.5 (the maximum historic earthquake on this fault was M 6.2). [17] The project area is expected to experience groundshaking level D (strong ground shaking) during a major earthquake which potentially could trigger landslides and rockfalls. [18] The site is not within an area susceptible to liquefaction and subsidence.

An earthquake with an estimated magnitude of 7.1 on the Richter Scale occurred in the Bay Area on the San Andreas Fault on October 17, 1989. The earthquake lasted about 15 seconds and caused damage in the epicentral

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16 "Probabilities of Large Earthquakes Occurring in California on the San Andreas Fault", U.S. Geological Survey Open-File Report 88-398, 1988.

17 "Earthquake Planning Scenario for a Magnitude 7.5 Earthquake on the Hayward Fault in the San Francisco Bay Area", California Division of Mines and Geology Special Publication 78, K. V. Steinbrugge et al, 1987.

18 San Francisco Seismic Safety Investigation, URS/John A. Blume and Associates, Engineers, June, 1974. Estimated intensity of future groundshaking in San Francisco is categorized in five levels, A (very violent) to E (weak).

region in Santa Cruz, Watsonville, Hollister, and Los Gatos.[19] San Francisco and other areas, as far as 50 miles from the epicenter, also suffered damage. Casualties and damage were caused by falling objects, collapsed structures, fire, and miscellaneous injuries (such as heart attacks). Most of the casualties and damage were a result of ground shaking which caused some freeway structures to collapse and masonry structures (including brick chimneys) to fall. Wood-frame buildings were jolted off their foundations in areas near the epicenter, as well as in San Francisco and other Bay Area cities. Ground failures also occurred, most notably in the Santa Cruz area near the epicenter. Landslides resulted in road closures and damage to structures. Liquefaction and ground settlement occurred in places farther from the epicenter (primarily, for example, in the Marina District of San Francisco and the area south of Market Street in San Francisco, and the Oakland International Airport). Fires resulted from ruptured utility lines. The type of damage caused by the earthquake is typical of moderate-sized earthquakes. Damage which occurred at distances up to 50 miles from the epicenter is evidence that the project area may be affected adversely by earthquakes occurring on any of the region's major faults.

A field visit was made to the site on October 22, 1989 to observe slope conditions and assess whether slope failure(s) occurred as a result of the October 17 earthquake and subsequent aftershocks.[20] Post-earthquake observations showed that:

- Boulders up to three feet in size had been freshly deposited on the flat bench area (paved for church parking) below the massive rock outcrop in the central portion of the site. Rock debris and brown discoloration (silt and clay dust) distinguished new material from larger boulders previously observed there. Debris had been swept from paved parking spaces. In addition, freshly broken branches were observed on the vegetated hillside directly above this area of recently deposited material. These observations were confirmed by comparing photographs of the massive chert outcrop taken in August, 1987 and October, 1989. One rock failure area was identified as attributable to the October, 1989 earthquake.

- The thinly-bedded chert located in the western part of the site did not exhibit signs of recent slope failure. However, rocks up to five inches in diameter were scattered across the former nursery school playground area and appeared to have been freshly deposited.

- Some rockfall activity appeared to have occurred on the slope behind the church. Rocks up to six inches

[19] 299 Second Street Office Building Supplemental Environmental Impact Report, 83.311E, Final SEIR, April 12, 1990, page 69. Part of that report's seismicity section is quoted in this paragraph.

[20] Memorandum to Louise Nichols from Ray Rice, Dames & Moore, October 27, 1989. The memorandum describes observations made on October 22, 1989 and is accompanied by site photographs. It is available for review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

in size had loosened from the rock face and were wedged behind the wire mesh. The wire mesh and rock bolts appeared to be in sound condition.

- Road cracks observed in the pavement of Edgehill Way at the top of the slope were not formed recently but were present and documented during an August, 1987 site visit. (Those cracks are believed to be associated with settlement of fill under the road and do not indicate either deep-seated movement of the massive chert rock or surficial rockfall activity.)

The evidence of rockfalls observed at the site was consistent with what would be expected for an unstabilized slope from the magnitude of seismic activity in October, 1989. [21]

GROUNDWATER

Information on groundwater at the site is limited. One of the test borings drilled in 1981 accumulated water at a depth of 35 feet after standing open two days; all other test borings were dry. This suggests that groundwater is relatively deep at this site which is consistent with what would be expected on the basis of topographic and geologic conditions. At lower elevations off-site, neighbors report damp ground around (and seepage in) their homes. [22]

B. TRANSPORTATION, CIRCULATION, AND PARKING

A project transportation study has been prepared by an independent consultant and is available for public review in the offices of the Department of City Planning, 450 McAllister Street. [23] The results of the study are summarized below.

EXISTING STREETS

The streets serving the site include Ulloa Street, Waithman Way, Portola Drive, and Laguna Honda Boulevard (see

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21 Ibid.

22 Letters of Joseph Gelvin, July 22, 1989, and Elbert Wilson, Jr., August 7, 1989, to the City Planning Commission on the Draft EIR for the project previously proposed on this site.

23 "Traffic Study, 300 Ulloa Street Single Family Homes Project, City & County of San Francisco, A Report to the Department of City Planning", DKS Associates, June 5, 1990.

Figure 1, page 9). Ulloa Street, in the vicinity of the project site, varies in width from 20 to 26 feet, and is a one-way street which runs eastbound to Laguna Honda Boulevard. Waithman Way is one block long and connects Ulloa Street to Portola Drive. An alley, south of Ulloa Street (and parallel to Portola Drive), runs between Kensington Way and Waithman Way and provides access to adjacent Ulloa Street homes; residents have complained about its use as a short-cut from Waithman to Kensington since Ulloa Street is one-way in the opposite direction. Laguna Honda Boulevard is a north-south street which forms a "T" intersection at Portola Drive. Portola Drive is a major four-lane east-west divided arterial street located one block south of Ulloa Street and connects Market Street with the southwestern part of the City.

Traffic control along Ulloa Street includes a two-way (all-way) STOP at Waithman, a three-way STOP at Kensington Way (this an all-way STOP, but because Ulloa is one-way, three directions are stopped), and a five-way STOP at Laguna Honda. Both Waithman Way and Kensington Way are controlled by STOP signs at Portola Drive; the center median on Portola Drive limits movements at both locations to right turns into or from Portola Drive. The Portola-Laguna Honda and Portola-Miraloma-Marne intersections are signalized.

The City's Master Plan classifies Portola Drive as a "major thoroughfare." No other streets in the vicinity of the site are designated by the Master Plan. Other streets in the vicinity of the site include Kensington Way, a 16-foot-wide residential street, and Miraloma Drive, which, while residential in character, serves as a north-south route both for Muni buses and automobiles. Mount Davidson acts as a topographic barrier to travel in the area, and Miraloma Drive is one of the faster routes to get around this barrier.

Sidewalks are located on both sides of Waithman Way, Laguna Honda, Portola Drive, and Kensington Way south of Ulloa Street. Ulloa Street has 5.5-foot wide sidewalks on both sides of the 200-block and a sidewalk on the north side only of the 300-block. North of Ulloa Street, sidewalk exists only along the west side of Kensington Way. An elevated pedestrian bridge spans Portola Drive near Kensington Way. No bikeways are marked on streets adjacent to the project site.

Curbside parking is permitted on both sides of Ulloa Street except during street cleaning hours (9:00 to 11:00 AM Mondays on the north side and 1:00 to 3:00 PM on Tuesdays on the south side). Compared with other San Francisco neighborhoods, on-street parking appears to be light on Ulloa Street between Kensington Way and Waithman Way, except on Sundays).[24] Heavier parking demand occurs on the 200-block of Ulloa Street (between

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24 Based on observations by Steve Colman, DKS Associates, the EIR traffic consultant, during nine visits to the site at various times of day on the following days: Monday, October 5, 1987; Wednesday, October 14, 1987; Friday, October 16, 1987; Sunday, November 1, 1987; Sunday, November 15, 1987; Friday, November 11, 1988; Tuesday, March 21, 1989; Wednesday, October 11, 1989; and Wednesday, May 2, 1990.

Waithman Way and Laguna Honda Boulevard) during arrival and departure times at St. Brendan's School and events at the church or school.

TRAFFIC VOLUMES

Average daily traffic (ADT) on Portola Drive is 28,500, based on counts conducted in October, 1987 and 1988. Counts on the 300-block of Ulloa Street indicated an ADT of 820 vehicles while the ADT on the 200-block of Ulloa Street is 1,081. Comparison with 1981-1982 counts shows that traffic on Portola Drive has grown by 1,208 in five years, an increase of 4.4% or 242 ADT per year. Traffic volumes on Ulloa Street appear to have grown by about 11% during the past six years, for an average growth rate of 1.8% per year.

Based on studies of residents' perceptions of traffic, most residents perceive that a street loses its residential character when traffic volumes exceed 1,200 to 3,000 vehicles per day.[25] The average daily traffic on the 200- and 300-blocks of Ulloa Street is lower than 1,200 vehicles per day. Traffic counts in 1988 suggest that traffic problems perceived on the 200-block of Ulloa Street may result from vehicles waiting to pick up children at St. Brendan's School. Some double parking occurs during the height of this activity. Individual delays last two minutes or less.

An analysis of vehicle speeds was conducted in the middle of the 200-block of Ulloa Street to assess whether there are speeding problems in this area. The analysis, conducted for two days, showed that fewer than three percent of all motorists exceeded the posted 25 MPH speed limit.

EXISTING TRAFFIC LEVELS OF SERVICE

Level of service (LOS) is a standard traffic engineering methodology for measuring intersection operations (see page A.17). Levels of service were calculated for study area intersections based on a somewhat conservative method which tends to under-estimate capacity and over-estimate congestion.

During the PM peak hour, the Portola-Laguna Honda intersection was found to be operating at LOS "D", within acceptable service levels. The signalized Portola-Miraloma-Marne intersection operates at LOS "B" during peak

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25 Studies of residents' perceptions of traffic include: "How Much Traffic is Too Much (Traffic)," Salem Spitz, ITE Journal, May 1982; "Improving the Residential Street Environment," Federal Highway Administration, May 1981; "Environmental Quality of City Streets: The Residents' Viewpoint," Donald Appleyard, Highway Research Record 352, 1971; Traffic in Towns, Colin Buchanan, 1963; and Livable Streets, Donald Appleyard, 1981.

hours; this intersection has a protected left-turn (three-phase signal) for westbound Portola Drive traffic turning into Miraloma-Marne.

Portola Drive and Kensington Way form a "T" intersection which permits right-turns only into and right-turns only out of Kensington Way. The intersection operates at LOS "A" for traffic turning right out of Kensington Way. Right-turns from Portola onto Kensington are unimpeded by other traffic movements.

TRAFFIC ACCIDENTS

Considering existing traffic volumes, the general area of the project site has a low accident frequency (number of accidents per year) and rate (number per million vehicles). The City's Traffic Engineering Division recorded two accidents at the Portola-Laguna Honda intersection, three accidents at the Portola-Waithman intersection, and two accidents at the Ulloa-Waithman intersection during the five-year period of 1981 through 1985.

PARKING CONDITIONS

Twenty-five percent or less of on-street parking spaces appear to be used on weekdays along the 300-block of Ulloa Street, where parking is permitted on both sides of the street.[26] About 25% of available parking appears to be used on Waithman Way. Use of parking on the 200-block of Ulloa Street varies, depending on times of day, but the highest use occurs near Laguna Honda Boulevard (in front of St. Brendan's School). During school release hours, more than 100% of the block's parking capacity is used because some double-parking occurs; cars tend to leave soon after school release times. On-street parking drops west of the school. On Sundays, parking is affected by attendance at area churches. Parked cars extend along most of the 200-block of Ulloa Street with fewer parked on the 300-block, none of which is associated with the First Church of the Nazarene.

EXISTING PUBLIC TRANSIT SERVICES

Bus service near the site is provided by Muni's 43-Masonic and 48-Quintara lines which have stops on Portola

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26 Observations of Steve Colman, op. cit., at different times throughout the day on the following days: Monday, October 5, 1987; Wednesday, October 14, 1987; Friday, October 16, 1987; Sunday, November 1, 1987; Sunday, November 15, 1987; Friday, November 11, 1988; Tuesday, March 21, 1989; Wednesday, October 11, 1989; and Wednesday, May 2, 1990.

Drive near Waithman Way and near Portola Drive and Laguna Honda Boulevard. Both stops are just over a block from the site. The 43-line uses Laguna Honda Boulevard and serves Fort Mason, the Western Addition, the Haight, City College, the Balboa Park BART station, and southern neighborhoods. The 48-line connects the West Portal Muni Metro station (located about five blocks or four-tenths of a mile from the site) to the project site, to Noe Valley, San Francisco General Hospital, the Mission District, the 24th Street BART station, and the Caltrain station at 22nd Street. Muni Metro lines K, L, and M serve the West Portal and Laguna Honda stations which are within walking distance of the project site.

Peak (commute) period passenger loads on both the 43 and 48 bus lines are moderate and allow almost all passengers a seat. Off-peak travel permits all passengers to be seated. Muni Metro lines operate at or near capacity during the peak hour in the project vicinity.

PEDESTRIAN TRAVEL

Most pedestrian activity in the project area is related to St. Brendan's School. The school's principal estimates that about 20% of the students walk to school. Most pedestrian activity occurs just before and just after school times. Pedestrian activity during the peak commute hours (4:00 to 6:00 PM) is lower than it is near the school release time (2:30 to 3:00 PM).

C. NOISE

This section is based on noise measurements made at six locations on Tuesday, November 29 and Thursday, December 1, 1988.[27] A continuous measurement was conducted for 15 hours across Edgehill Way from the northern site boundary, and short, spot measurements were taken at various times of day at other locations on and near the site, including on Waithman Way, the access driveway and bench, behind the church, and both sides of Edgehill Way. Measurements made on Edgehill Way provide a conservative estimate of on-site exposure to traffic noise generated on Portola Drive due to the direct line-of-sight to that street; measurements made on Waithman Way provide a conservative estimate of off-site exposure to project-generated traffic noise. The measurements indicate that traffic on Portola Drive dominates the noise environment of the area.

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27 Noise measurement data are on file at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco. The fundamental concepts of environmental acoustics are described in the Appendix, pages **A.18** through **A.21**, where noise terms also are defined.

The measurements indicate that the existing ambient noise level at the site is in the range of 60 to 65 decibels (dBA) [28] outside upper floors of proposed homes (an L_{dn} of 61 dBA) and is below an L_{dn} of 60 dBA outside first floors. [29] The Environmental Protection Element of the City of San Francisco Master Plan uses the L_{dn} noise descriptor to evaluate the compatibility of residential land uses with the outdoor noise environment. The Master Plan considers residential uses to be compatible with outdoor noise levels of up to an L_{dn} of 60 dBA with no special noise insulation requirements; if the outdoor L_{dn} is between 60 and 65 dBA, the Master Plan recommends that new development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features are included in the design.

The measurements also indicate that the daytime background noise level is 54 dBA outside existing homes on Edgehill Way with direct sight-lines to the bench, 47 dBA outside on homes Rockwood Court opposite the bench, and 48 dBA along Waithman Way near the Ulloa Street intersection below the bench. During late night-early morning hours, the L_{dn} is as low as 48 dBA on Edgehill Way and about 41 dBA on Rockwood Court. The difference is due to the fact that backyards of Rockwood Court homes are more shielded from noise generated on Portola Drive than Edgehill Way homes are.

D. URBAN DESIGN

Except for the existing church, the site is undeveloped. It is contiguous to single-family homes on three sides and to undeveloped, City-owned open space on the fourth (western) side.

The site's visual character is defined by topography and vegetation, as well as its relationship to adjacent built and unbuilt properties. The most visually prominent feature of the site is its exposed rock face, created by quarrying which altered the original landform and which has been subjected to natural processes of rock and soil movement down the slope. The disturbed character of the site contrasts visually with the adjacent City-owned open space.

The amount and type of vegetation growing on the site varies with elevation and with rock and soil conditions. The western part of the site generally is wooded, primarily with eucalyptus trees. Other evergreen trees are growing at scattered locations elsewhere on and near the site, including around the church and a visually

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28 The decibel (dB) is a logarithmic unit of sound energy intensity. Sound waves, traveling outward from a source, exert a force known as sound pressure level (commonly called "sound level"), measured in decibels. dBA represents the decibel corrected for the variation in frequency response of the typical human ear at commonly encountered noise levels.

29 The City of San Francisco uses the L_{dn} noise descriptor to evaluate the compatibility of residential land uses with the outdoor noise environment. The L_{dn} is a single-number rating of the daily noise environment at a given location, and the calculation of the L_{dn} accounts for the increased sensitivity of people exposed to noise at night.

prominent clump in the rear yards of Ulloa Street homes downhill from the site.

The existing church is located on the man-made bench in the eastern part of the site. When viewed from the south, the 40-foot high steeple does not break the profile of the hillside. Slope stabilization measures implemented behind the church are visible from some on-site locations. The church building was not rated by the City's 1976 architectural survey.

Due to its location on Edgehill Mountain, the site is visible from nearby and more distant viewpoints, including from public areas and developed residential neighborhoods on lower elevations of Mount Davidson. All or part of the site is visible from intersections on or south of Portola Drive, such as Portola-Rex, Juanita-Rex, Portola-Marne, Juanita-Del Sur, and Cavas-Del Sur. The site is not visible from upper elevation public open space areas on Mount Davidson where trees or other obstructions block views to the site; the site cannot be seen from the top of Mount Davidson which is surrounded by an eucalyptus forest or from pedestrian paths on non-forested grassland areas.

Representative views of the site from locations accessible to the public in the surrounding neighborhood are shown in Figures 13, 14, and 15, pages 42-44.

E. OPEN SPACE

The site is adjacent to City-owned open space under the jurisdiction of the Recreation and Park Department. Commonly known as Edgehill Mountain Open Space, the area was acquired by the City between 1984 and 1985 and is located on the western side of Edgehill Mountain. It contains mature eucalyptus trees, dense undergrowth, and footpaths. There are no signs which identify the open space to the public, and it is believed that the open space currently attracts few users from outside the immediate neighborhood. Public access to the area is available from Kensington Way, although there are no designated trails from Kensington Way. Access to the open space from the project site is via a cut in the fence separating the two parcels. According to Recreation and Park Department staff, there are no plans to develop the open space area. [30]

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30 Telephone conversation between Louise Nichols and Deborah Learner, San Francisco Recreation and Parks Department, August 21, 1990.

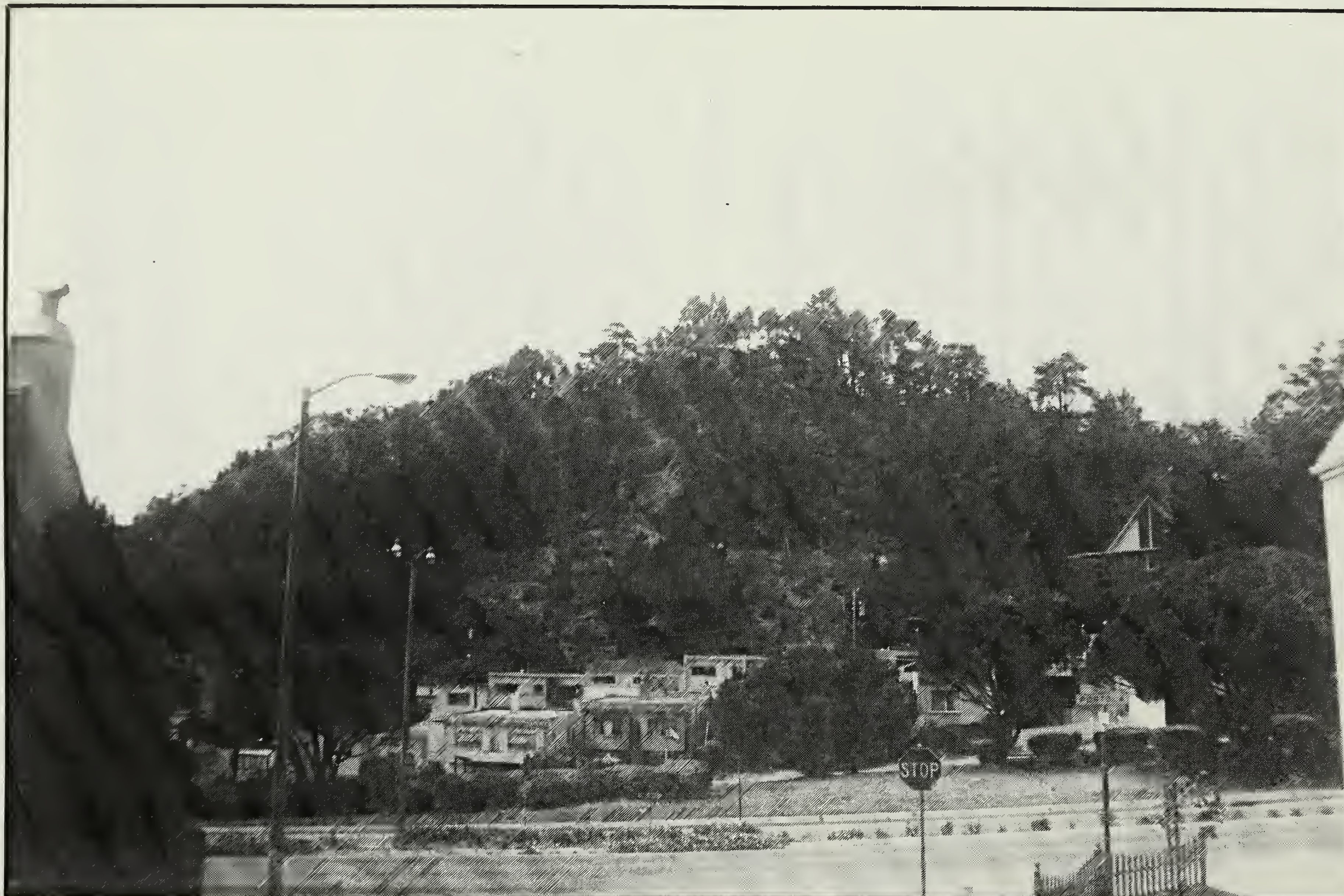

Figure 13 - Photograph -- View of Project Site Looking North from Portola Drive-Rex Avenue Intersection from Developed Area of Mount Davidson

Source: Warner Schmalz, AIA

Figure 14 - Photograph -- View of Project Site Looking West from Portola Drive-Waithman Way Intersection

Source: Warner Schmalz

Figure 15 - Photograph -- View of Project Site Looking North from Portola Drive-Miraloma Drive-Marne Avenue Intersection from the Developed Area of Mount Davidson

Source: Warner Schmalz

V. ENVIRONMENTAL IMPACTS

An environmental evaluation application for a 120-bedroom residential care facility was filed by the project sponsor on June 23, 1987 (Case No. 87.399E). A preliminary Negative Declaration was published by the Department of City Planning, April 29, 1988, and amended, May 23 and July 1, 1988 (see Appendix A, page A-4). Upon appeal of that Negative Declaration, in July, 1988, the City Planning Commission adopted Resolution 11393 which required the preparation and identified the scope of an EIR on that project. In June, 1989, a Draft EIR (DEIR) on that project was published, and in August, 1989, the City Planning Commission held a public hearing on the DEIR and received written comments. The project sponsor subsequently withdrew the residential care facility application and on February 12, 1990 filed an application for a Conditional Use permit to build 13 single-family detached housing units on the site (the currently proposed project). The 1989 DEIR assessed potential effects on the environment in the areas of geologic, transportation, noise, visual, open space, and population impacts for the prior residential care facility project, as directed by Resolution 11393. This EIR addresses the same specific issues for the currently proposed project and considered comments on the 1989 DEIR relevant to this project during preparation. Not all of the impacts presented in this section are physical environmental effects as defined by the California Environmental Quality Act (CEQA). Non-physical effects are included here for informational purposes only.

A. GEOLOGY

IMPACTS OF THE ENVIRONMENT ON THE PROJECT

Since the church was built in 1960, portions of the site have been affected by landslides and rockfalls on several occasions. Slope instability at the site occurs in two forms:

- Accumulation of fine-grained debris by sloughing or raveling of thinly-bedded chert bedrock and its weathered soil overburden.

- Rockfalls of the massive variety of chert bedrock from the steep bluffs above the central area of the site.

The raveling type of movement can occur either gradually, as part of the normal weathering process, or more rapidly, particularly during periods of high intensity rainfall, such as during the heavy storms of January, 1982. The end product of this raveling is the fan-shaped accumulation of soil and rock debris which has formed an "apron" at the toe of much of the existing slope. This type of slope movement can result in nuisances and

require long-term maintenance rather than endangering life or safety.

According to Dames & Moore, rockfalls, consisting of up to tens of cubic yards of large masses, can occur suddenly and without warning, particularly during periods of heavy rainfall and/or major seismic events. Such movements can damage or threaten structures or human safety. [31]

Development of the site would need to take both these types of geologic hazards into account.

IMPACTS OF THE PROJECT ON THE ENVIRONMENT

Rockfalls and landslides would be expected to occur in the future with or without project implementation. The project could increase instability through excavation of or construction on the site's existing slopes.

SLOPE STABILIZATION MEASURES

As discussed in greater detail in Chapter III, Project Description, pages 15-24, the proposed project would include a combination of protective walls and/or fences and slope stabilization measures to reduce the types of slope instability found on the site -- rockfalls and raveling/sloughing. The rock stabilization techniques proposed have been used widely and successfully to ensure against massive rockfalls at similar sites [32]; they consist of:

- Removing loosened rock masses from steep portions of the slope, installing rock bolts and wire mesh;
- Scaling slope of loose material, including boulders which have already fallen from the rock exposures;
- Flattening steep portions of the slope crest;
- Draping slope with wire mesh secured to slope; and
- Constructing a catchment wall at the toe of the slope.

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[31] 300 Ulloa Street Residential Care Facility Draft EIR, Case No. 87.399E (on previous project), June 30, 1989.

[32] Ray Rice, Dames & Moore.

Surface drainage facilities proposed by the project would collect runoff on the site and divert flows away from the rear yards of properties adjacent to the southern site boundary. The introduction of building and paved surfaces on the site would reduce surface water infiltration and would result in a decreased contribution of groundwater to the observed seeps and damp conditions at adjacent downslope properties. Groundwater encountered during construction in the extreme southern part of the site would be intercepted with the proposed drainage system and diverted from this area. The proposed alterations to surface and subsurface drainage and seepage conditions would improve slope stability.

SEQUENCE OF SLOPE STABILIZATION

The possibility of rockfalls occurring during construction would depend on the sequence of tasks to stabilize the hillside. Potential off-site impacts on downhill properties would be minimized by implementing more hazardous measures first, such as removing large unstable rock masses and shaping the crest of the thinly-bedded chert, followed by installing rock bolts and covering the slope with wire mesh. The proposed catchment wall would be built last so that rocks dislodged while stabilizing the slope would not expose construction workers to unnecessary danger.

Stabilization is proposed to begin by removing existing vegetation and loose boulders on vertical slopes by hand. The crest of the slope in Area C would be flattened where it is oversteepened or overhanging, and removing the roots of trees growing on the western part of the site would be intended to reduce raveling of the slope. In order to remove boulders, laborers would be located on a platform attached to a crane operated at the base of the slope or lowered by ropes from the top of the slope. If required, large blocks would be broken up using a portable hydraulic jackhammer and removed using a clam-shell bucket from the mobile crane. The extent of boulder removal has not been estimated yet but would be evaluated concurrently by an engineer and engineering geologist during field inspections. Upon completion of this task, the remaining outcrop is expected to consist of stable material similar to the conditions exposed behind the church.

Rock bolts would be installed from the crane-operated platform. Ten- to fifteen-foot deep holes would be drilled into the rock face, an anchor bolt would be inserted in the drill hole and cemented in place, and a cover plate and tension bolts would be attached to the remainder of the anchor bolt protruding from the rock. The specific locations where rock bolts would be installed within Area A (Figure 5, page 16) have not been determined at this preliminary design stage. They would be selected by the project engineering geologist after the rock mass has been scaled of loose materials, based on the condition of the rock mass, orientation, and spacing of fractures exposed on the face.

Wire mesh draped over the rock face would be secured by drilled anchor bolts. Anchor bolts would be installed around the perimeter of the rock mass and at selected locations within the area of the wire mesh drape. An example of this technique is visible on the slope behind the existing church at the eastern end of the site (Figure 7-B, page 18).

Two other measures once considered for the site by the sponsor have since been deleted from the project. One was to place gunite on the slope, and the other was to stabilize Edgehill Way. A location in San Francisco where gunite has been used is the hillside at 17th and Clayton Streets. Gunite can be used to reduce water penetration and, thus, minimize deterioration of the slope. Saturated slopes are susceptible to landsliding, and one principal concern about stability problems at the site is the potential for landsliding during periods of prolonged and/or intense rainfall. The earlier proposal to use gunite at the site was replaced with the proposed use of wire mesh in order to permit landscaping to be planted on the slope. Stabilization of Edgehill Way was proposed previously when part of the site along Edgehill Way was considered for development. Stabilization of Edgehill Way would not be required to reduce potential rockfalls and, thus, would not be included as part of the project. Part of the slope northwest of the site on 305 Edgehill Way property would be stabilized as part of the project. The sponsor would need to receive formal authorization from those adjacent property owners who have agreed in concept to the proposed stabilization.

It is difficult to estimate the duration of rock bolts and wire mesh because site-specific conditions, such as climate or the configuration of a specific slope, vary. The rock bolt and wire mesh system would be intended to function for the life expectancy of the project. Deterioration of the wire would be apparent visually, due to sagging of wire mesh or displacement of vegetation, whereupon the mesh would be repaired. A maintenance program would be implemented as part of project development. The program would include funds (an amount as yet unspecified) for periodic inspection of the stabilization system and for removal of debris accumulated behind the wall, as required. In addition, the drainage facilities would be inspected on a regular basis and cleared of debris, as required to maintain their function. Details of the maintenance and inspection programs have not been defined. The program would be developed by the project sponsor. The homeowners' association for the project would be responsible for its implementation.

DIFFERENCE CF EXPERT OPINION

Two geotechnical consultants, Don Hillebrandt Associates and Dames & Moore, have evaluated the feasibility of site stabilization for the project site for a variety of purposes and projects since 1978. They have expressed different opinions concerning several aspects of site stabilization scenarios, including the source of instability (whether surficial or deep-seated), adequacy of existing data to develop stabilization schemes, and

details and anticipated costs of stabilization alternatives. The following discussion outlines the stabilization approaches suggested by these two consultants over the years and summarizes their opinions on the measures listed above.

Don Hillebrandt Associates

Two different general approaches to site development were identified and evaluated qualitatively in June, 1981, for a proposed condominium development.[33] The first approach would attempt to stabilize the hillside and prevent additional slide activity. The second approach would not attempt to stabilize the hillside but accommodate future rockfalls and sloughing/raveling by building a protective wall and fence system which it was determined possibly would fail but would protect life and occupied building space.

The first approach was judged to be difficult and dangerous because of:

- The height of the slope and its steepness.
- The existing vegetation, including trees, which is dense at some locations.
- The large percentage of the steep hillside not within the limits of the site.

The second approach was recommended to be used. It would consist of:

- Protective walls and fences at the toe of the slope, varying in size, extent, and location according to site-specific conditions.
- At least one, possibly two, protective fences across the slope at selected locations.
- Landscaping with deep-rooted plants at selected locations.
- Setbacks between the slope and walls and between the walls and development.
- Construction of rear building walls as reinforced structures.
- Periodic cleaning behind the walls in addition to appropriate maintenance and repair work.

Reinforced protective walls were recommended to be approximately ten feet high, from one and one-half to three feet thick, and topped with chain link fencing. Walls were recommended to be set back five to fifteen feet from the toe of the slope, and buildings were recommended to be set back another fifteen to forty feet for a total distance of fifteen to fifty-five feet between the toe and buildings.

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33 Preliminary Geotechnical Investigation, Don Hillebrandt Associates, June, 1981. As noted in Chapter IV, the reports and associated letters which have been prepared for this and prior development proposals are available for review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

In 1987, a two-phased stabilization program for the immediate vicinity of the church structure, as well as the remainder of the site, was proposed, the first of which was implemented. The Phase 1 stabilization completed behind the church was reviewed, and comments were made on Phase 2 to follow. [34] During Phase 1 large rocks were removed, loose materials were scaled, rock bolts and wire mesh were installed, and a retaining wall was built between the slope and church. Phase 2 stabilization/protective measures to be completed in the area west of the church generally would be similar to those performed for Phase 1 except on a much larger scale. Heavily reinforced fences would be built across the entire slope, a protective wall probably would be built at the toe of the slope, buildings would be set back ten to fifteen feet from the wall, and rear walls of development would be designed as heavily reinforced retaining walls. It was concluded that "if properly designed stabilizing measures are installed on the slopes and appropriate protective measures are incorporated into the design (generally as described above), the existing graded pad at the site is suitable for planned development". Phase 2 was not subsequently implemented.

In June, 1988 comments on the then-proposed residential care facility, setbacks of ten to fifteen feet between the toe and reinforced wall and ten to fifteen feet between the wall and building were discussed, as was the recommendation that "several additional heavily reinforced protection fences would have to be installed" across part of the slope. [35] The setback was recommended to provide a buffer zone "necessary because it is virtually impossible to completely stabilize the entire hillside". In the opinion of Mr. Hillebrandt, because of the potential for a large rockfall during prolonged winter rains and/or a moderate to strong earthquake, even if elaborate slope stabilization measures were to be implemented, a large rockfall could severely damage a heavily reinforced wall and deposit rock and debris in the "buffer zone".

Dames & Moore

In a 1978 consultation to the First Church of the Nazarene regarding a recent rockfall, it was concluded "that there is no practical means of precluding future rockfalls and that work should be implemented to minimize the hazard from potential future falls". [36] Recommended measures consisted of:

- Removing loose rock masses from dangerous zones (work should take place before other actions).

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34 Letter of Donald Hillebrandt to Reverend Fred Forster, September 23, 1987.

35 Letter of Donald Hillebrandt to Elbert Wilson, Jr. (Neighborhood Action Coordinator, Opposition to the 300 Ulloa Project Neighborhood Group), June 7, 1988.

36 Slope Stabilization Investigation, First Church of the Nazarene, Dames & Moore, August, 1978.

- Reconstructing a concrete block wall which had been damaged by a rockfall with a buttress, possibly with compacted earth fill, on the front.
- Clearing a five-foot-wide space behind the retaining wall to enlarge the catchment area.
- Removing trees from the top of the slope where root growth could cause progressive slope deterioration and rockfalls.
- Reconstructing, reinforcing, and extending chain link fences.
- Relocating the nursery school playground.

The church subsequently was unable to find a contractor to perform the work, and the measures were not implemented, except for relocation of the play area farther west from the church (Figure 1, page 9 shows the relocated play area).

In 1979, subsequent consultation for the church provided recommendations which reiterated that the intent would not be to "retain the hillside but to accommodate potential future rockfalls by a fence system that might yield but still protect life and occupied building space".[37] Recommendations consisted of:

- Clearing the area immediately behind the retaining wall of brush and debris to provide a larger catchment area.
- Reconstructing the western end of the retaining wall and adding chain link fencing on top.
- Repairing and extending chain link fences upslope of the retaining wall.
- Constructing an independent wall adjacent to the northwest corner of the church between the existing fence and structure.

In 1987, the area behind the church was stabilized in the Phase 1 program by Soil Engineering Construction, Inc., reviewed by Mr. Hillebrandt. Subsequently, a construction program was recommended by Dames & Moore for the then-proposed residential care facility to stabilize the remaining area west of the church. The construction program consisted of:[38]

- Flattening the top of existing slopes.
- Removing loose rock masses and rock bolting the remaining rock mass.
- Removing partially buried chert boulders.
- Stabilizing, probably underpinning, Edgehill Way.

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[37] Supplementary Report, Slope Hazards Investigation, First Church of the Nazarene, Dames & Moore, October, 1979.

[38] Letter of Joseph Jeno and John Theissen, Dames & Moore, to Ivan Christie, Office of Environmental Review, Department of City Planning, June 7, 1988, referring to letter of November, 1987.

- Controlling erosion and shallow sloughing in the western area by creating a gradual slope, scaling the surface to remove weaker materials, and covering the slope with wire mesh.
- Providing a catchment wall at the base of the slope to intercept smaller rocks and eroded material which might roll down the slopes.

In 1988, Dames & Moore noted that "due to the risk to structures above and below the slope ... a slope stabilization program would be preferable to leaving the slope in its present unstable state".[39] Dames & Moore stated that the existing slope would require stabilization work and concluded that "construction can be accomplished using equipment and techniques available at this time, as evidenced by the recent slope stabilization program which was completed for the adjacent church". It also was noted that the project sponsor had obtained an understanding with the adjacent property owners on Edgehill Way to stabilize those locations. Because the residential care facility was in preliminary planning stages, it was stated that final design of specific slope stabilization measures would "meet the static and seismic requirements of the San Francisco Building Code and such additional requirements which might be proposed by the Bureau of Building Inspection". In addition, building setbacks were discussed in response to the 20-foot setback mentioned in the Preliminary Negative Declaration.[40] While building setback criteria had not been provided at that time, it was noted that setbacks specified in June, 1981 (by Don Hillebrandt Associates) were for non-stabilized slopes. Later in June, 1988, minimum setbacks of ten feet from a new toe of the slope were recommended.[41] The pending single-family housing project would provide a minimum setback of 34 feet between a 5- to 12-foot high catchment wall (below stabilized slopes) and residential structures.

SUMMARY OF OPINIONS

Failure Mechanisms/Adequacy of Data

Don Hillebrandt Associates questions the deep-seated stability of the hillside. Concerns focus on the overall stability of the hillside during prolonged winter rains and/or a moderate to strong seismic event. Mr. Hillebrandt believes that existing data are inadequate to assess overall stability or to identify meaningful measures to address conditions present on the site.[42]

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39 Ibid.

40 Preliminary Negative Declaration, April 29, 1988, as amended on May 23 and July 1, 1988.

41 Letter of Raymond Rice and John Theissen, Dames & Moore, to Ivan Christie, Office of Environmental Review, Department of City Planning, June 24, 1988.

42 Letter of Donald H. Hillebrandt to Carolyn A. Johnston, Morrison & Foerster, July 27, 1989, submitted to the City Planning Department as comments on the 300 Ulloa Street Residential Care Facility, June, 1989 Draft EIR (Case No. 87.399E).

Dames & Moore reports that the types of slope failures which have occurred on the site in the past and are expected in the future represent surficial slope instability, not deep-seated failures. Major or massive movements typical of deep-seated failures have not been experienced at the site and are not anticipated in the future except, perhaps, during a very large earthquake. [43] Dames & Moore's observations at the site after the moderate October, 1989 earthquake support this conclusion. [44] Deep-seated slope failures commonly occur along adversely-oriented clay "seams" which lose strength when water pressure in the soil structure is increased. When these clay seams are oriented downward and out toward the slope face, they facilitate movement of the overlying material. Mapping of the slope in August, 1987 showed that the contact between the thinly bedded chert and the massive chert dips into the hillside at approximately a 30-degree angle from horizontal. A deep-seated slope failure between the thin and massive chert along the intervening clays would be unlikely, if not impossible, due to the orientation of the plane of weakness between the two rock units. [45]

Dames & Moore believes that the geologic structural data developed by field observations, measurements, and mapping are appropriate for evaluation of slope stabilization scenarios and that it is impractical to attempt to obtain subsurface geotechnical data, for example by drilling, due to the extreme steepness of the rock slope.

Details and Costs of Stabilization Alternatives

Don Hillebrandt Associates' stabilization program relies on a system of heavily reinforced walls and fences coupled with relatively large (15 to 55 feet) setbacks of structures from the slope to provide protection for proposed development. The anticipated costs for elaborate stabilization measures were very roughly estimated to range between $2,000,000 and $5,000,000. [46]

Dames & Moore's approach recommends stabilizing the steeply sloping parts of the site by removing unstable rock masses and installing rock bolt and wire mesh support systems coupled with a reinforced concrete catchment wall and minimum 34-foot setbacks of structures. The estimated cost, based on discussions with the contractor who performed the Phase 1 stabilization program behind the church, is about $644,000. [47]

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43 Slope Hazard Investigation, First Church of the Nazarene, Dames & Moore, 1978.

44 Memorandum to Louise Nichols from Ray Rice, Dames & Moore, October 27, 1989. As noted previously, this memorandum describes observations made on October 22, 1989 and is accompanied by site photographs.

45 This is explained in more detail in "Memorandum to Louise Nichols from Dan Martin and Ray Rice, Dames & Moore, June 11, 1990" on file at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

46 Letter of Donald Hillebrandt to Barbara Sahm and Ivan Christie, July 6, 1988.

47 Letter to Louise Nichols from Ray Rice, Dames & Moore, January 30, 1990. This letter contains information supporting the cost estimate and is available for review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

Review of Building Plans

Final building plans for the project, including slope stabilization plans and geotechnical studies, would be reviewed by the Bureau of Building Inspection, as part of the building permit process.

In reviewing building plans, the BBI refers to a variety of information sources to determine existing hazards and assess requirements for mitigation. Sources reviewed include maps of Special Geologic Study Areas and known landslide areas in San Francisco, as well as building inspectors' working knowledge of areas of special geologic concern. The geotechnical investigation(s) prepared for the site and the project would be available for use by the BBI during its review of building permits for the site. The BBI could require that additional site-specific soils reports be prepared in conjunction with permit applications, as needed. In addition, the BBI has the right to impose additional measures it may feel necessary to ensure that the project can be constructed safely. The BBI also has the right to revoke the project's use permit at any time in the future if it believes that the lives of people on the site are in danger as a result of an inefficient slope stabilization maintenance program.

B. TRANSPORTATION, CIRCULATION, AND PARKING

As noted previously, a transportation study has been prepared on the project and is available for review. [48] This section summarizes the results of that study.

TRIP GENERATION

The Institute of Transportation Engineers' (ITE) updated Trip Generation report estimates that single-family homes generate approximately ten vehicle trip ends per day in suburban areas. In San Francisco studies, a trip generation rate of 7.5 vehicle trip ends typically is used. However, the ten vehicle trip end (VTE) per day rate has been used in this EIR for two reasons. First, the proposed houses are large and would only be affordable by upper income families; higher income families typically make more trips than lower income

[48] "Traffic Study, 300 Ulloa Street Single Family Homes Project, City & County of San Francisco, A Report to the Department of City Planning", DKS Associates, June 5, 1990. As noted above, this study is available for review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco. Appendix B, page A.14, also contains additional transportation information.

families. Second, a traffic count conducted on Edgehill Way (adjacent to the proposed project site) indicated that the 30 to 32 homes on this looped street generate 302 to 325 VTE per average weekday -- a trip generation rate of almost exactly 10 VTE per home per day. [49]

The project's total daily trip generation would be 130 vehicle trips on an average day. Peak hour trip generation rates would be about 11% to 12% of the daily total and, based on the traffic counts conducted on Edgehill Way, would occur between 4:15 and 5:15 PM on an average weekday. The directional split (inbound versus outbound) would be two-thirds in and one-third out. Thus, during the PM peak hour, there would be about 14 VTE generated by the proposed project (9 trips in and 5 trips out). This assumes that all units are occupied. The trip generation rate includes trips by residents, visitors, service vehicles, and all other types of vehicles.

PROJECT TRIP DISTRIBUTION

Vehicle trip distribution of project-generated traffic was estimated by observing turning movements at nearby intersections, identifying trip generators and attractors (job locations, stores, etc.), and accounting for the effects of Ulloa Street as a one-way street on circulation patterns.

Based on the above factors, an estimated 75% of the inbound traffic would approach the project site from Portola Drive westbound, turning right on Waithman Way, and 25% of project traffic would approach the site from the west, using the 300-block of Ulloa Street. (Please see Figure 1, page 9, for reference.) Outbound from the site, 55% of the traffic would use Waithman Way, making a right-turn on Portola Drive, and 45% of project traffic would turn left and use the 200-bock of Ulloa Street to reach Laguna Honda Boulevard.

PROJECT-GENERATED TRAFFIC IMPACTS

Levels of Service with Project Traffic

The traffic impacts of the project are shown in Table 2, page 56. The only change in the volume/capacity ratio would occur at the Portola-Laguna Honda intersection where project traffic would increase the volume/capacity ratio by 0.01, an amount which would be imperceptible to motorists. No intersection levels of service would

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49 Based on counts conducted Sunday, November 12, 1988 through Tuesday, November 15, 1988, "Traffic Study, 300 Ulloa Street Elderly Residential Project (Residential Care Facility), City & County of San Francisco, A Report to the Department of City Planning", DKS Associates.

TABLE 2
Existing, Project, and Cumulative Traffic Impacts
PM Peak Hour a/ Level of Service b/ (V/C ratio) on an Average Weekday

Scenario	Intersection of Portola Drive with: Laguna Honda Boulevard c/		Miraloma/ Marne c/		Kensington Way d/	
Existing (1987-1988)	D	(0.83)	B	(0.62)	A	(b/)
Existing + Project	D	(0.84)	B	(0.62)	A	(b/)
Cumulative Impacts:						
1997 Without Project	E/F	(1.02)	C	(0.76)	B	(b/)
1997 With Project	E/F	(1.02)	C	(0.76)	B	(b/)

a/ A peak hour of 5:00 to 6:00 PM was used for this analysis because it is the time of greatest traffic volumes in the vicinity.

b/ See Table A-2, page A.17, for Level of Service definitions.

c/ Circular 212 Planning Method for signalized intersections.

d/ Using 1985 Capacity Manual (Chapter 10) for unsignalized intersection "reserve capacity" method. Volume/capacity ratios are not used for unsignalized intersections.

Source: DKS Associates

change as a result of project-generated traffic. During mid-day and evening off-peak times, when service levels would be better than those presented in Table 2, page 56, the effects of project-generated traffic would be less than during peak hours.

Traffic Impacts on the Residential Environment

Neighbors of the site have expressed concern about the project adding traffic to the 200-block of Ulloa Street between Waithman Way and Laguna Honda Boulevard, the primary location where parents drop-off or pick-up students at St. Brendan's School. Although the average daily traffic on the 200-block of Ulloa Street of 1,081 vehicles is considered low compared to many other residential streets in San Francisco, short peaks occur when parents transporting children arrive at or leave the school. During these peaks, limited street frontage for parking or waiting vehicles also contributes to traffic delays.

During a 24-hour weekday period, the project would generate an estimated 130 vehicle trips, half of which would be inbound (65) and half outbound (65). During the peak traffic generating hour of the project (which would occur some time between 4:15 and 5:15 PM), 14 vehicle trips would be generated -- 9 inbound (to the site) and 5 outbound (from the site). Only outbound traffic leaving the site (none inbound) could use the 200-block of Ulloa Street, since it is one-way, and, of all outbound traffic, 45% would be expected to use this block (with the other 55% using Waithman Way). Of the approximately 29 daily vehicle trips the project is expected to add to the 200-block of Ulloa Street, about 5 or 6 vehicle trips would be added during the peak school hour of 2:30 to 3:30 PM on a school day. Additional trips attributable to the project which might be made on the alley between Ulloa Street and Portola Drive have not been estimated; the increase would not be statistically significant on a daily basis but could be noticeable to adjacent residents.

The maximum number of vehicles acceptable in a residential environment is a subjective, psychological value which is not well understood. The science of traffic engineering is based on measurement of project's traffic impacts using observable quantities that can be established by scientific methods. Objectively establishing "how much traffic is too much" which relates to traffic volumes at acceptable operating conditions relative to intersection capacity may be different from a resident's intuitive perception of "how much traffic is too much". The latter depends on how people value such intangibles as quiet and perceived safety; such perceptions and valuations may vary not only from one person to another but from one location to another and also may change over a period of time.

There is general agreement in the transportation profession that there is a threshold between acceptable and unacceptable levels of traffic to maintain a residential character on a street, but there is no widely used procedure to indicate whether an increment of new traffic on a street would or would not be noticeable to residents. One methodology which professes to provide this type of evaluation is the TIRE Index method (Traffic Infusion in a Residential Environment) invented by Donald Goodrich. According to documentation provided by Mr. Goodrich:

> TIRE is a numerical representation of a resident's perception of the effect of street traffic on activities such as walking, cycling and playing, and on daily tasks such as maneuvering an auto out of a residential driveway. TIRE is expressed by index values that range from zero, representing the least effect of traffic, to five, representing the severest effect ... any traffic change that would cause an index change of 0.1 or more would be noticeable to street residents.

No documentation is available to explain how the TIRE index values were derived or how the threshold of noticeability was determined. [50] In response to neighborhood concerns, an evaluation of traffic impacts generated by the project was made using the TIRE methodology. The results show that neither the 200- nor 300-

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[50] Telephone conversation between Steve Colman, DKS Associates, and Donald Goodrich, December 19, 1988.

bock of Ulloa Street would be affected by noticeable increase in traffic, although, as of the 1988 counts, the 200-block of Ulloa Street is near the threshold volume of traffic where a street loses its residential character, according to this methodology, regardless of whether the proposed project is developed.[51]

CUMULATIVE DEVELOPMENT

There are currently no new development proposals in the vicinity of the project. An historical trend in "background traffic growth" on Portola Drive was developed assuming a conservatively high scenario of a cumulative annual growth rate of 2.2% per year. By applying a straight-line growth factor of 22%, peak Portola Drive volumes were escalated from 1987 to 1997 values. This is likely to represent a conservative estimate, since growth in San Francisco is likely to occur at a lower rate in the 1987-1997 period than occurred in the 1981-1987 period, due to passage of Proposition M.

The analysis indicates that, as shown in Table 2, regardless of whether the project is built, the Portola Drive-Laguna Honda Boulevard intersection would operate at LOS "E/F" during the PM peak hour. Portola Drive at the Miraloma-Marne and Kensington intersections would be expected to operate at LOS "C" and "B", respectively.

LOCALIZED TRAFFIC IMPACTS AT ULLOA-WAITHMAN INTERSECTION

Traffic travelling toward the site would use the 300-block of Ulloa Street or Waithman Way, which form a "T" intersection near the site driveway. Waithman Way and the site driveway are not aligned to create a four-way intersection with Ulloa Street (the centerlines are offset by about thirty feet), but people approaching the site from Waithman Way enter the driveway by making a short "dog-leg" movement across Ulloa Street.

The project would increase the number of vehicles making this movement; it is estimated that 75% of the entering traffic (37.5% of the ADT) would cross Ulloa Street from Waithman Way. This movement does not appear to be precluded by law but it may be confusing to some motorists on Ulloa Street or Waithman Way.

The City's Traffic Engineering Bureau could reposition the stop signs at Ulloa Street and Waithman Way and the

51 Appendix B, pages A.14 to A.16, contains a description of the TIRE methodology and its limitations; a more detailed description of the methodology is presented in "Traffic Study, 300 Ulloa Street Elderly Residential Project (Residential Care Facility), A Report to the Department of City Planning", DKS Associates, on file at the Office of Environmental Review, 450 McAllister Street, San Francisco.

legends at the Ulloa-Waithman intersection in order to develop a suitable junction which would allow project bound vehicles from Waithman Way to enter the site more easily.

PARKING IMPACTS

Under the City Planning Code, one parking space per dwelling unit would be required for the project. Thus, the Code would require 13 off-street parking spaces. The project would provide 26 residential parking spaces (2 per unit) 7 spaces along the access road for residents and visitors, and another 40 spaces for the church (for a total of 73 net new spaces).

The actual overnight average demand of the project would be about 20 to 26 spaces, based on census data for the surrounding census tract. Occasional peaks in demand (such as when there is a party or other social gathering) may exceed the 33 spaces reserved for residential use but would be unlikely to exceed the 73 spaces provided on-site unless there was a simultaneous church event. On one Sunday in November, 1987 at 11:15 AM, the parking demand for the Church of the Nazarene was 22 spaces (services begin at 11:00 AM); on another Sunday, closer to Thanksgiving, 30 spaces were occupied. The Church now has 40 spaces which would not remain and would have 40 spaces with the project (that is, there would be no net change in parking for the church); excess church parking would be available to residents.

EMERGENCY VEHICLE ACCESS

The San Francisco Fire Department has reviewed the site plans and architectural drawings dated December 5, 1989, and takes no exceptions to the design as presented. [52]

TRANSIT IMPACTS

Based on average transit use rates of San Francisco residents, it is likely that the project would generate about 13 transit trips per day. Nearby transit lines in the area include the 43-Masonic and 48-Quintara bus lines and Muni Metro lines K, L, and M. The increase in transit demand associated with the project would not noticeably affect transit service in the area.

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52 Letter to Larry MacDonald of the Department of City Planning, from James R. Lynch, Assistant Chief, Fire Department, April 20, 1990. A copy of this letter is on file and available to review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

CONSTRUCTION IMPACTS

Project implementation would take about 14 months for completion of the slope stabilization program, site preparation, and construction of the homes. The project sponsor estimates that 4,500 cubic yards of material would be removed during the initial slope stabilization phase, requiring 430 truck round-trips. During this anticipated 1-month period, there would be an average of 30 truck trips generated per day (15 in and 15 out) via local streets. During the subsequent site improvement and home construction phase (about 1 month) about 1,500 cubic yards would be excavated from homesites and utility trenches which would require a maximum of 10 inbound truck trips (empty) and 10 outbound trips (full) per day. At other times, two to three round trips would be expected per day. Truck trips could potentially damage adjacent streets. The project sponsor would require the contractor to request the Department of Public Works to inspect the pavement conditions on the 200- and 300-blocks of Ulloa Street and Waithman Way before the start of construction and after completion of construction on the project. The project sponsor or the contractor would compensate the City should any undue damage occur on the 200- or 300-blocks of Ulloa Street or on Waithman Way as a result of construction truck traffic generated by the proposed project. The contractor would require either the superintendent or his assistant to monitor truck movement into and out of the project site in order to reduce any conflicts with vehicles traveling on Ulloa Street. A maximum of 16 construction workers would be on the site at any one time who would require one parking space each; workers would be expected to park on-site or on Ulloa Street.

C. NOISE

The following discussion summarizes a noise impact assessment prepared for the site. [53]

The Environmental Protection Element of the City of San Francisco Master Plan considers residential uses to be compatible with outdoor noise levels of up to an L_{dn} of 60 dBA with no special noise insulation requirements. If the outdoor L_{dn} is between 60 and 65 dBA, new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. The noise measurement survey indicates that the existing L_{dn} at home facades ranges from below an L_{dn} of 60 dBA outside the first floors to an L_{dn} of up to 65 dBA outside upper floors.

As recommended by the Environmental Protection Element of the San Francisco Master Plan, an analysis of noise

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53 "Environmental Noise Assessment for the 300 Ulloa Senior Care Facility EIR", Illingworth & Rodkin, Inc., January 13, 1989. A copy of this report is available for review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, San Francisco.

reduction measures would be prepared by the project sponsor and recommended noise insulation features would be included as part of the proposed project.

PROJECT OPERATION

The L_{dn} outside second floors of proposed units is higher than 60 dBA, above which the Master Plan recommends that special noise reduction and insulation features be included in the project design. Since the Master Plan does not define what level is appropriate, the interior noise level identified in State standards for multi-unit housing [54] (Title 24, Part 2 of the California Government Code) could be considered. That noise level is 45 dBA. The project would provide operable upstairs windows which could be closed at occupants' discretion and would reduce the interior noise level to meet the State standards.

Sources of on-site noise would be typical of sound levels generated in the surrounding neighborhood from normal residential activities. The rock wall behind site units would reflect energy generated by activities on the site. The reflected energy would tend to pass over immediately adjacent homes on the north side of Ulloa Street but would reach homes farther from the site (on the south side of Ulloa Street, on Portola Drive, and at more distant locations). Because sound levels decrease with distance from the source, project-generated noise would be below existing ambient noise levels at these more distant locations and would not be audible above background noise.

Project-generated traffic was also analyzed to estimate changes in existing noise levels. The greatest potential for increased noise levels would occur during the project's PM peak hour (between 4:15 and 5:15 PM) when background noise in the surrounding area also would be highest due to traffic on Portola Drive. The addition of project-generated traffic would result in less than a one-decibel increase in the average noise level during any hour at existing homes along all local streets serving the site and near the site driveway. A one-decibel change is undetectable except under laboratory conditions; a three-decibel increase generally can be heard. [55]

The side facade of 320 Ulloa Street, the home nearest to the site driveway, is located about 25 feet from the center of the site driveway, and the rear yard is more than 50 feet from the driveway. Based on noise levels

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54 The State of California's standards do not apply to single-family housing.

55 The Effects of Noise on Man, Karl D. Kryter, 1970.

measured along other residential streets with grades as steep as 15% [56], the average noise level at the facade of this home during the PM peak hour would increase by 1 dBA to become 56 dBA; the noise level in the rear yard at that time would be lower than 50 dBA. This noise generation is considered typical in residential development; these effects would be temporary and intermittent. The project sponsor proposes to build a two-foot-high solid concrete traffic barrier parallel to the south side of the site driveway for traffic safety; due to the lower elevation of the rear yard at 320 Ulloa Street, a traffic barrier could reduce outdoor noise levels generated along the driveway. Noise levels outside other homes farther away from the site driveway would decrease with distance from the driveway; project-generated traffic on the driveway would not be expected to increase background noise levels measurably (less than one decibel) outside those homes.

Noise levels in the site's outdoor parking areas would range from less than 50 dBA when people start and maneuver cars to a maximum of 55 dBA when people rev their car engines. With daytime background noise levels of 50 to 55 dBA in the area, automobile noise generated on the site would be barely detectable, at most, above the background noise outside nearby homes.

PROJECT CONSTRUCTION

Project construction is expected to take about 14 months. Construction-generated noise would be subject to the restrictions of the San Francisco Noise Ordinance. The highest noise levels would be generated during site clearance, excavation, slope stabilization, foundation preparation, and building erection.

During the first slope stabilization phase, noise would be generated by portable jackhammers, if used to break up large blocks of rock not loose enough to be removed by hand. Portable jackhammers typically generate sound levels of 80 dBA at a distance of 50 feet and also result in some vibrations. Maximum noise levels of 70 to 75 dBA could result intermittently outside homes on Rockwood Court during the 4-month hillside stabilization phase. Continuous noise levels and occasional instantaneous bursts of higher sound levels emanating from the site could be audible south of Portola Drive, depending on weather, time of day, and traffic conditions. Noise would diminish with distance from the site and, farther away, would become indistinguishable from background traffic noise. Removal of an estimated 4,500 cubic yards of material would require about 320 round (640 2-way) truck trips for an average of 15 round-trips (30 2-way trips) per day during about a month. This truck traffic would generate an estimated average noise level of 50 to 55 dBA and a maximum noise level of about 80 dBA outside homes along the streets used by the trucks. The average noise levels would be lower than existing

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56 Measurements on which these estimates are based were made for other projects by this EIR's acoustical engineers, including "Meadowsweet Quarry, An EIR for 40 Residential Units on 21.82 Acres in Corte Madera," prepared for the Town of Corte Madera, September, 1979, and "Crestview Drive Extension Environmental Acoustics Analysis", letter from Richard Illingworth, P.E., to John Guilhamet, Senior Civil Engineer, San Mateo County Department of Public Works, August, 1980.

average noise levels along these streets, including Ulloa Street and Waithman Way to Portola Drive, depending on the truck routes established for the project. (One criterion in selecting routes would be to expose the fewest number of people to truck-generated noise levels.) Maximum levels can be compared to noise generated by buses and trucks driving on Portola Drive.

During the subsequent site improvement and home construction phase on and below the bench, maximum instantaneous noise levels would reach 80 to 85 dBA at a distance of 50 feet. Homes on Ulloa Street nearest the site would be about 50 feet from the closest construction location on the bench; homes on Rockwood Court and Edgehill Way would be farther from bench construction. Maximum instantaneous noise levels would be expected to reach 80 to 85 dBA in the rear yards of the Ulloa Street homes, 70 to 75 dBA outside the homes along Rockwood Court, and 75 to 80 dBA outside the nearest homes on Edgehill Way.

These levels would vary as equipment and construction move across the site, but fairly constant noise levels would be generated within a 5- to 10-dBA range of 75 to 85 dBA during periods of intense construction when several pieces of equipment are used. These noise levels would interfere with conversation outdoors; noise levels indoors with the windows closed would be about 20 dBA lower but would interfere with conversation and relaxation.

Finishing work would take place inside the units and would be quieter than site preparation and building erection work. Noise levels during this phase would not be expected to interfere with indoor or outdoor conversations at adjacent residences.

Short-term increases in noise levels would be audible in the City-owned open space west of the site and could affect people's enjoyment of the open space. Construction-generated noise also could disrupt resident wildlife temporarily.

The site improvement and home construction phase would involve truck trips to remove excess dirt and rocks for foundation excavations and utility trenches (about 1,500 cubic yards) and to deliver building materials to the site. A maximum of ten one-way (twenty two-way) trips would be made per day by large diesel tractor trailers; two to three one-way trips per day would be normal. This truck traffic would result in noise levels similar to those generated by trucks removing material scaled from the hillside during the stabilization phase -- an estimated average noise level of 50 to 55 dBA and a maximum noise level of about 80 dBA outside homes along the streets used by the trucks. Generally, noise levels over 60 dBA could be considered a nuisance.

Construction trucks traveling to and from the site during either slope stabilization or site improvement/home construction phases would generate vibrations noticeable to people when the vehicles pass their homes. Because

the intensity of vibrations could be felt, the vibrations could be annoying to some people. The vibrations would not be continuous and would not occur after the short-term construction period.

Construction noise is regulated by the San Francisco Noise Ordinance (Article 29 of the City Police Code). The ordinance requires that sound levels of construction equipment other than impact tools not exceed 80 dBA at a distance of 100 feet from the source. Impact tools (jackhammers, pile drivers, impact wrenches) must have both intake and exhaust muffled to the satisfaction of the Director of Public Works. Section 2908 of the ordinance prohibits construction at night, from 8:00 PM to 7:00 AM, if noise would exceed the ambient noise level of five dBA at the project property line, unless a special permit is authorized by the Director of Public Works.

The project sponsor would require that the project contractor muffle and shield intakes and exhausts, shroud and shield impact tools, and use electric-powered rather than diesel-powered construction equipment, as feasible, so that noise would not exceed limits stated in the City's Noise Ordinance (Article 29, San Francisco Administrative Code, 1972).

Because of the proximity of existing residences to the site and the possibility that some residents in the area could be annoyed by construction noise (people who sleep in the daytime, for example), the contractor would designate a person to receive complaints from neighbors affected by construction noise. The project sponsor or his contractor would notify all neighbors within a 300-foot radius of the site of the name of the designated individual who may be contacted for noise related problems.

D. URBAN DESIGN

A photomontage illustrating the proposed project in approximately five years from completion is presented in Figure 16, page 65.

Views of the site would change during project construction phases and following completion of the project. The expected visual character of the site is described below.

A total of 112 existing trees of all sizes would be removed from the western part of the site, as shown in Figure 17, page 66, and itemized below. These include mostly eucalyptus and some cypress trees. Of those, 15 trees (3 under and 12 over 6 inches in diameter) would be removed above the bench before loose rocks and boulders are scaled off during hillside stabilization. The other 97 trees to be cut down (37 under and 60 over 6-inch diameter) are located below the bench on proposed Lots 1-4.

Figure 16 - Photomontage -- View of Project Looking North from Portola Drive-Rex Avenue Intersection from the Developed Area of Mount Davidson

Source: Douglas Chun And Associates

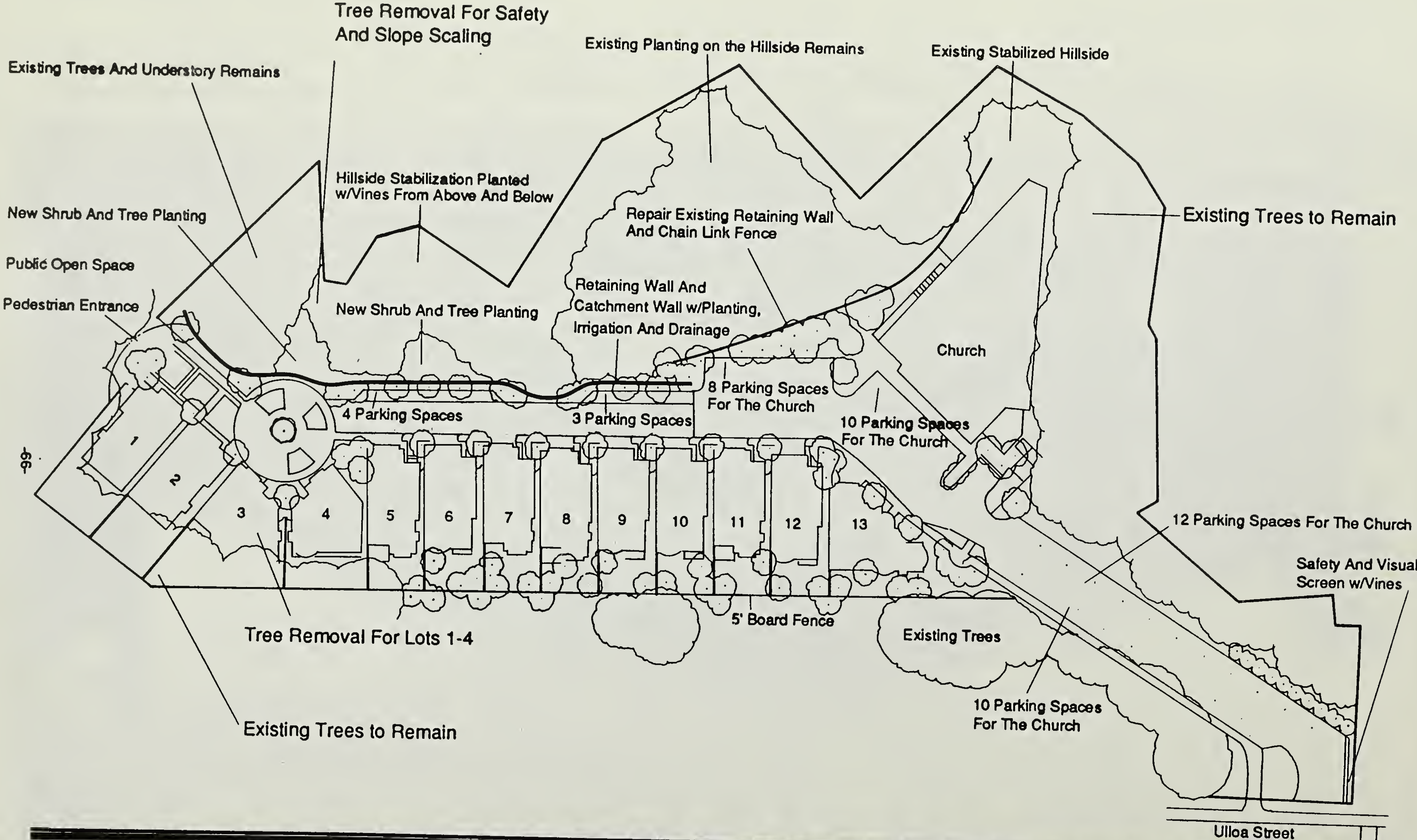

Figure 17 - Conceptual Landscape Plan

Source: Emery Rogers and Associates

	Diameters Under Six Inches	Diameters Over Six Inches	Total
Trees Removed for Stabilization	3	12	15
Trees Removed for Lots 1-4	37	60	97
Total Trees Removed by Project	40	72	112

The largest tree to be removed would be a mature eucalyptus tree, 15 inches in diameter; most trees have 10-inch diameters or smaller.[57] Tree removal would be confined to the project site, and vegetation growing off-site, such as on the City-owned open space, would remain.

The project would expose more of the quarry face to view than presently is visible because of the site stabilization program and would alter existing views of the site. Site hillsides above and below the bench would be bare after tree removal and would contrast with the wooded City-owned open space and remaining on-site vegetation. The appearance of the slope would be modified further if loose rocks were removed and the hillside were recontoured. The exposed ends of rock and anchor bolts, metal disk cover plates, and wire mesh would be visible upon inspection from on-site locations and from some nearby off-site locations when installed. These materials would not be visible from off-site locations farther away on or south of Portola Drive. As illustrated by the bolts and mesh used behind the church (Figure 7-B, page 18), the visibility of these materials would vary according to on- and off-site viewpoint. Essentially, the slope stabilization work would remove trees from the site and remove loose materials, resulting in a somewhat denuded hillside until new vegetation grows. Reshaping of some slopes would change the visual rock massing to some extent. This would be noticeable from near views and not from farther vantage points.

The proposed single-family homes would be built after the slope has been stabilized and would introduce development where, apart from the church, none has existed. The project would extend development in a horizontal band across the bench, from the existing church building to the contiguous City-owned open space. Because the bench's ground elevation is higher than existing Ulloa Street homes, the proposed units would be visible above development to the south. Project units also would be visible against the backdrop of the rock face, especially in the early years after development before landscaping, discussed below, has matured. The three-story project units would appear larger than predominantly two-story homes visible in foreground views of the site. The maximum height of units would be lower (35 feet) than the church steeple (40 feet) but taller than the church roof without the steeple (about 10 feet to the eaves). Proposed units would dominate

57 Telephone conversation between Louise Nichols and Emery Rogers, Emery Rogers and Associates (project sponsor's landscape architect), June 8, 1988.

foreground views of the City-owned open space for people looking west from vantage points located east of the site.

The project's landscaping plan is presented in Figure 17, page 66. Figure 17 identifies where landscaping would be planted and shows existing vegetation to be retained by the project. New landscaping would involve planting of 112 replacement trees in the western part of the site, vines from above and below the hillside stabilization area where wire mesh would be installed, and ornamental shrubbery and trees along the access road, retaining wall, front entrances to units, and southern property line. While a detailed planting plan and specific plant list have not been prepared, a general "palette" of plants and a conceptual landscape plan are proposed, as summarized below. [58]

The sponsor would select tree species for their longevity and strength and would use a mix of coniferous and broadleafed evergreen trees for screening and deciduous flowering trees for accents. The types of trees being considered for the project include Silk Tree, Red Ironbark, Primrose Tree, Myroporum laetum (which has no common name), and Italian Stone Pine. Trees proposed to be planted on the site would not match the size of the trees removed. Six- to ten-foot high trees of the species noted above would be installed and would be expected to grow to heights of 30 to 40 feet at maturity (about 10 to 20 years). Silk Tree, Primrose Tree, and Myroporum laetum are quick-growing species.

Shrubbery and ivy would be planted on site slopes. Algerian Ivy would be planted on the stabilized slope draped with wire mesh. This woody evergreen vine is characterized by rapid, rampant growth and would be expected to cover the hillside fully in about five to eight years. Other fast-growing shrubs would be planted on lower slopes above the bench, such as Ceonothus "Julia Phelps" (no common name), Orchid Rockrose, Saint Catherine's Lace, and, on the rock bank north of the access road, mass plantings of Stonecrop. The heights of these shrubs would range from about four to six feet at maturity (about 5 to 10 years). Ornamental shrubbery and groundcover would be planted elsewhere on the site, also, primarily in front yards of the residences.

Except for trees to be planted along a new southern property boundary fence, no landscaping would be planted in rear yards of proposed homes as part of the project so that future homeowners could plant their own gardens. The new property line trees would be installed on both sides of a five-foot high wooden fence, in the rear yards of project and existing Ulloa Street homes, and would be irrigated. The sponsor would need to receive authorization for these off-site activities from the adjacent homeowners.

Newly installed landscaping would reduce some but would not be expected to eliminate fully the visual effects

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[58] Ibid., and "List of Proposed Landscape Plants with Descriptions", Emery Rogers and Associates, May 25, 1990.

of project implementation. When properly installed and maintained, vegetation would grow and mature at which time the project would have a more established appearance than during the years immediately after completion.

E. OPEN SPACE

For people who use the site driveway from Ulloa Street to reach the City-owned open space, the project would retain public access by providing a sidewalk along the access road to the western site boundary and an entrance to the open space. Alternate routes to the open space via the site's southern slopes, below the bench, would be blocked by the new single-family homes and fences separating the proposed lots.

Site residents would be expected to use the City-owned open space, thus increasing public use and enjoyment of the area by about 50 people.

The project site is located in a 40-X height and bulk district. Buildings of 40 feet or less in height are not subject to the requirements of Section 295 of the City Planning Code (the City's Park Shadow Ban Ordinance). The maximum building heights of 35 feet would comply with the site's height and bulk restrictions. As a result of the project, sunlight would not reach parts of the open space in mornings until a later hour.

F. POPULATION

A maximum of 16 construction workers would be on the site at any one time. The existing church presently employs one person who would not be affected by the project. The project would introduce an estimated 50 residents to the site when fully occupied. Given an approximately 3.3 acre site, the project would have a residential density of about 15 people per acre, below the level recommended for RH-1/"Low Density" districts (24-31 persons per acre). Combined with the lack of privately-owned lots similar in size to the project site in the surrounding area, there is no evidence that the project would induce substantial growth or concentration of population.

VI. MITIGATION MEASURES

GEOLOGY

In the course of project planning and design, measures were identified which would reduce or eliminate potential geotechnical environmental impacts of the project. The measures were incorporated into the project or would be adopted by the project sponsor, architects, or contractors. Other measures could be adopted by the City. No other potentially significant adverse geotechnical impacts for which additional mitigation would be required would result from the project. Thus, no further mitigation measures would be required.

As discussed in Chapter V, Environmental Impacts, pages 45-53, and below, the final building plans, including slope stabilization measures proposed as part of the project and described in Chapter III, Project Description, pages 15-24, would be review by the Bureau of Building Inspection. The Bureau is required to review final building plans, including geotechnical studies, as part of the permit application process. For this reason, this requirement does not constitute a project mitigation measure. For informational purposes, the project would include the following slope stabilization features:

- Remove loose rock masses, install rock bolts, and drape wire mesh.
- Scale slope of loose material.
- Flatten or shape crest of slope.
- Drape slope with wire mesh secured to slope.
- Construct catchment wall.
- Implement long-term slope maintenance program

In addition to the slope stabilization measures proposed as part of the project, the Bureau of Building Inspection (BBI) would review the final building plans, as well as geotechnical studies prepared for the project. In reviewing building plans, the BBI refers to a variety of information sources to determine existing hazards and assess requirements for mitigation. Sources reviewed include maps of Special Geologic Study Areas and known landslide areas in San Francisco, as well as building inspectors' working knowledge of areas of special geologic concern. The geotechnical investigation(s) prepared for the site and the project would be available for use by the BBI during its review of building permits for the site. The BBI could require that additional site-specific soils reports be prepared in conjunction with permit applications, as needed. In addition, the BBI has the right to impose additional measures it may feel necessary to ensure that the project can be constructed safely. The BBI also has the right to revoke the project's use permit at any time in the future if it believes that the lives of people on the site are in danger as a result of an inefficient slope

stabilization maintenance program.

Excavation and filling during project construction would be minor, and the project buildings would be lightly-loaded (i.e., the weight of the buildings themselves would not be so great as to jeopardize slope stability). Water runoff from both the project pads and the hillside above the pads would be collected and transported directly to the City sewer system which would reduce the amount of water runoff presently affecting the site's southern slopes.

AIR QUALITY

The project sponsor would require the general contractor to sprinkle excavation areas with water continually during excavation or earthmoving activity; sprinkle unpaved construction areas with water at least twice per day to reduce dust generation by about 50%; cover stockpiles of soil, sand, and other materials; cover trucks hauling debris, soils, sand, or other such material; and sweep streets surrounding the project site at least once per day to reduce particulate emissions. The project sponsor would require the project contractor to maintain and operate construction equipment so as to minimize exhaust emissions of particulate and other pollutants by such means as a prohibition on idling motors when equipment is not in use or when trucks are waiting in queues, and implementation of specific maintenance programs (to reduce emissions) for equipment that would be in frequent use for much of the construction period.

VII. SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSED PROJECT IS IMPLEMENTED

This chapter identifies significant impacts which could not be eliminated or reduced to an insignificant level by mitigation measures included as part of the project or other mitigation measures, as described in Chapter VI, Mitigation Measures, pages 70-71. This chapter is subject to final determination by the City Planning Commission as part of its certification process of the EIR. Chapter VII of the Final EIR will be revised, if necessary, to reflect the findings of the Commission.

No significant project-specific or cumulative impacts have been identified. Measures included as part of the project which would eliminate or reduce impacts to insignificant levels are described in Chapter III, Project Description, pages 15-24, Chapter V, Environmental Impacts, page 45, and for informational purposes in Chapter VI, Mitigation Measures, pages 70-71.

VIII. ALTERNATIVES TO THE PROPOSED PROJECT

This chapter identifies alternatives to the proposed project, discusses environmental impacts associated with each alternative, and gives the sponsor's reasons for rejection of each in favor of the project. Regardless of the sponsor's reasons for rejection, the City Planning Commission could approve an alternative instead of the project, if the Commission believed the alternative would be more appropriate for the site. Table 3, page 84, provides a summary for comparison of the alternatives.

INTRODUCTION, ALTERNATIVES NOT INCLUDED

The project would be infill housing development, similar to many housing proposals in San Francisco. The project site is difficult to develop due to geotechnical constraints and is also similar to many housing opportunity sites in the City. If an alternative site were chosen for infill housing development like the proposed project, the 300 Ulloa Street site would remain vacant (as in the No Project Alternative, page 74) and would continue to be subject to rockfalls and raveling.

It would be speculative to choose an alternative site from among the vacant sites in the City zoned for residential use, which the Department of City Planning estimates could accommodate about 1,500 units.[59] The Department estimates that there are about 580 acres of undeveloped or underdeveloped land suitable for housing development throughout the City, not all of which are currently zoned for residential development.[60] Many of the sites also have geotechnical problems (for example, the Graystone Terrace/Burnett Avenue area, Bernal Heights, parts of Bayview Hill, and so on).

The Residence Element of the Master Plan encourages development of all available sites for housing. To leave vacant (undeveloped) all sites with possible geotechnical problems, when such problems can be mitigated, would require a major change in policy and would reduce the City's ability to provide housing at a time when demand is high and San Francisco has an acknowledged imbalance in housing compared to employment. Such a policy change would not conform to the Association of Bay Area Government's (ABAG's) current policy which is to provide more housing in the main regional job centers.

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59 Residence Element, Proposal for Adoption, Department of City Planning, July, 1990, page 54. The Residence Element was adopted September 13, 1990 by the City Planning Commission, Resolution No, 12020.

60 Ibid., page 49.

The sponsor considered the project site ideal for a residential care facility, the previously proposed development concept for the site, which the sponsor believed was needed in the neighborhood. The sponsor did not look at other locations in San Francisco before proposing the residential health care facility on the project site and did not look at other sites thereafter when that prior application was withdrawn and replaced by the current application requesting approval for single-family residential development there.

For all of the above reasons, no alternative site analysis has been included in this EIR.

A. ALTERNATIVE A -- NO PROJECT

This alternative would entail no change to the project site. The existing church would remain, but the proposed project would not be built. Existing vegetation would remain, and no alteration or stabilization would occur on exposed slopes of the site's hillsides.

If the No Project Alternative were implemented, none of the impacts associated with the project would occur. The environmental characteristics of this alternative generally would be as described in the Environmental Setting section of this report (see Chapter IV, Setting, pages 27 through 44). The site's slopes would continue to ravel with the weathering process, and landslides and rockfalls could be expected in the future during periods of heavy rainfall or during a moderate or major earthquake. No new traffic would be generated from the site and added to local streets, and there would be no change in the existing noise environment due to use of the site, primarily during project construction. Under this alternative, the site would remain vacant, available for development in the future.

This alternative was rejected by the sponsor because it would not provide a return on his investment and would not use the development potential of the site allowable under the City Planning Code.

B. ALTERNATIVE B -- RESIDENTIAL CARE FACILITY

Development of a residential care facility for senior citizens was considered on the site, and facilities of three different sizes were assessed. One of those, a 120-unit, 93,660 square-foot facility is examined below. The other two -- a 107-unit, 83,780 square-foot facility and a 150-unit, 110,000 square-foot facility -- are not discussed further.

Alternative B assumes development of a 93,660 square-foot residential care facility with a 27,930 square-foot

footprint. Alternative B is illustrated conceptually in Figure 18, page 76. The building would consist of two to four stories over parking. Building heights would be 30.5 feet (average) and 40 feet (maximum). The facility would contain a maximum of 120 bedrooms and would accommodate about 140 residents at full occupancy. Approximately 26 people would be employed on the site; a maximum of 15 employees would be expected to be working at any one time. Off-street parking for 61 cars would be provided, including 21 spaces for the project and 40 spaces for the church. Parking also would accommodate handicapped people (three spaces), truck loading (one space), and a van shuttle vehicle (one space).

Average building height, as measured according to City Planning Code Section 102.11(c), would be 30 feet 6 inches, compared with the project (from the lowest average height of 24 feet to the highest average height of 32 feet 11 inches). As a residential care facility for seven or more persons, this alternative would require Conditional Use authorization by the City Planning Commission.

Alternative B's residential care facility would be exposed to the same geotechnical conditions as the project and would be subject to future gradual raveling or more sudden massive rockfalls off the site's unstable slopes. This alternative would include slope stabilization measures identical to those described for the project. Alternative B's residential care facility would be located nearer to the recontoured toe of the slope (set back about ten feet from a catchment wall) than homes proposed by the project (with a setback of thirty-four feet). This alternative would include more excavation to build this facility's garage than would be required to prepare homesite building pads for the project.

Alternative B would generate an average of about 200 vehicle trips on an average weekday (about 54% more than the estimated traffic generated by the project). Approximately 36 of these trips would be expected to be made during the peak period identified for this alternative of 2:00 and 3:30 PM. This peak period primarily reflects arrival and departure times for shift employees; the period also corresponds to the off-site peak when parents pick up students at St. Brendan's School in the 200-block of Ulloa Street. Alternative B would result in a 0.01 increase in the TIRE (Traffic Infusion on a Residential Environment) Index on the 300-block of Ulloa Street and a 0.02 increase on the 200-block; this methodology defines a 0.10 or greater increase as noticeable. The project would generate about 14 trips during the PM peak hour (between 4:15 and 5:15 PM) and would also generate 7 to 9 trips during the peak hour of Alternative B (between 2:00 and 3:30).

Noise impacts during operation of Alternative B would be same for the project except that this facility would involve operation of rooftop mounted mechanical equipment which would generate noise levels barely audible outside homes on Edgehill Way (with direct lines-of-site to the facility) when background noise at night is as low as 48 dBA and outside homes on Rockwood Court homes (farther from the site) when nighttime noise is as low as 41 dBA. At other times, mechanical noise at these locations would be masked by traffic and other noise

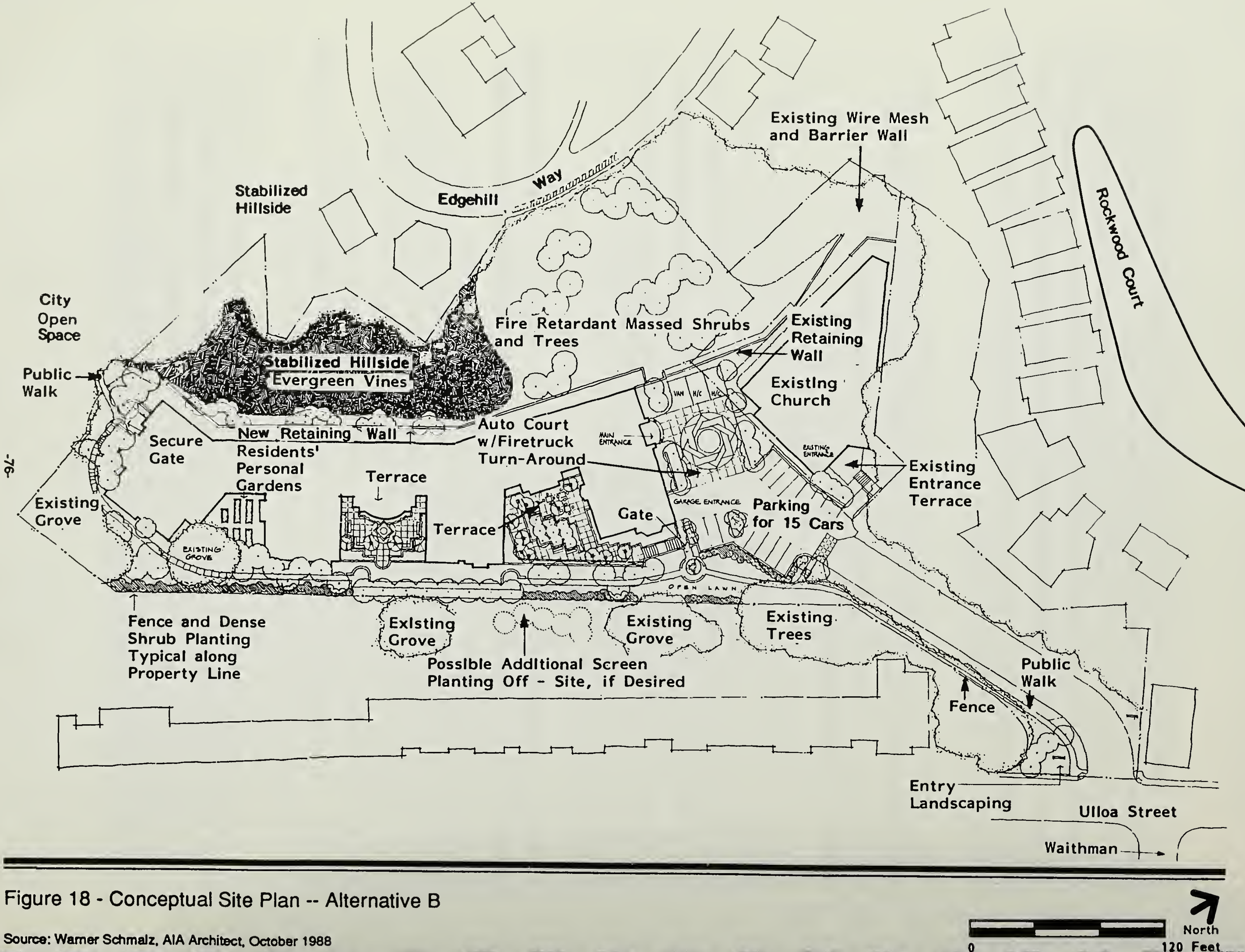


Figure 18 - Conceptual Site Plan -- Alternative B

Source: Warner Schmalz, AIA Architect, October 1988

sources; elsewhere, other homes would be shielded acoustically from mechanical noise. Construction-generated noise generally would be similar to the project's except that Alternative B's implementation period would be 16 to 18 months long, compared with 14 months for the project. In addition, removing excess dirt and rocks excavated for this facility's garage would require about 50 truck trips per day (25 in and 25 out) compared with the project's maximum of about 30 trips per day (15 in and 15 out).

The site would be visible from the same locations with Alternative B or the project. A photographic montage of the residential care facility is presented in Figure 19, page 78. The short- and long-term visual effects of slope stabilization behind Alternative B's building would be identical to the project's. Construction of this alternative would remove 35 trees with diameters of 6 inches or larger compared with the project's removal of 72 6-inch trees or larger because this alternative would be set back less from the toe of the slope, so would encroach less on the trees on the southern part of the site, and would not extend as far west. The maximum building height of the residential care facility would be 40 feet compared with the 35-foot maximum height of project units. As a result, the structure would rise higher in relation to the church steeple (40 feet) than the project and would be more visible against the site's hillside backdrop than the project. Alternative B would consist of one building with a southern facade articulated by staggered setbacks of 15 to 45 feet compared with 13 separate single-family homes. The spatial character of Alternative B would differ from the project. Alternative B's building would not extend as far east or west across the bench as single-family development under the project; the residential care facility would be setback 25 feet from the western site boundary and City-owned open space and about 60 feet from the church (the project would be set back 10 feet from the western site boundary and 50 feet from the church). Thus, the horizontal band of development would be 25 feet shorter for Alternative B than with the project. Setbacks from the southern property line would affect the relationship of site development to adjacent homes built on the north side of Ulloa Street; the residential care facility would provide 23-foot setbacks from the southern property boundary, compared with 15- to 32-foot setbacks of project units.

Alternative B would provide public access to the City-owned open space. Increased use of the open space by senior citizen residents of the site would be expected to result in minimal impacts. Alternative B would comply with the site's 40-X height and bulk restrictions and would not be subject to the requirements of Section 295 of the City Planning Code (the City's Park Shadow Ban Ordinance), the same as for the project. Alternative B would result in a population density of about 42 persons per acre, compared with the level of 24 to 31 persons per acre for RH-1/"Low Density" recommended by the Residence Element of the Master Plan; the project density would be about 15 people per acre.

The sponsor has rejected Alternative B due to public opposition expressed at a City Planning Commission hearing held in August, 1989 when Alternative B was the proposed project, the subject of a prior Draft EIR.

Figure 19 - Photomontage -- View of Alternative B Looking North from Portola Drive-Rex Avenue Intersection from the Developed Area of Mount Davidson

Source: Chun Ishimaru and Associates

C. ALTERNATIVE C -- SINGLE-FAMILY RESIDENTIAL

Development of single-family homes was considered on the site according to two different densities and types. One assumed development of 13 detached units on the "bench" with access from Ulloa Street. The other assumed development of 31 units, the maximum allowable for the site under RH-1(D) zoning, including 28 attached units on the "bench" with access from Ulloa Street and three detached units near the site's northern property line with access from Edgehill Way. The sponsor subsequently selected the 13-unit development as the proposed project; that project is the subject of this DEIR. The 31-unit development, Alternative C, is discussed below and illustrated in Figure 20, page 80.

Alternative C assumes that "bench area lots would measure from 25 to 31 feet wide by 76 to 110 feet deep, for an average lot size of about 2,500 square feet. Each lot would be developed with two, approximately 1,500-square foot attached dwellings. "Bench" area buildings are assumed to be four stories in height and have three bedrooms per dwelling. The 3 lots which would front Edgehill Way would measure 23 to 35 feet by 100 feet, for an average lot size of about 4,160 square feet. The detached dwellings would contain 2,500 square feet, consist of 4 stories, and have 4 to 5 bedrooms. Access to the 28 "bench" area dwellings would be provided from Ulloa Street along the alignment of the existing driveway. This internal street would be extended west, parallel to the toe of the hillside, and would end in a cul-de-sac at the western site boundary; it would form a 24-foot wide paved buffer located six feet south of a hillside retaining wall. Dwelling units would be set back by approximately 48 feet from the hillside, about 23 feet from the site's southern property line, and about 25 from its western property line. Off-street parking for one car per unit would be provided. Three separate curb-cuts off Edgehill Way would serve driveways of the detached units under Alternative C; garage parking for two cars per detached unit would be provided. An additional 17 parking spaces would be shared with (and located near) the church.

Slope stabilization measures for Alternative C would consist of the following:

- Flattening the overhanging or steep slopes in the western portion of the site.

- Building a six- to eight-foot-high (depending on final design recommendations) reinforced concrete catchment wall at the toe of the major slope.

- Building an underpinning wall along Edgehill Way consisting of drilled, cast-in-place concrete piers connected by a reinforced concrete grade beam and tied back across the road. (Figure 21, page 81, illustrates this measure schematically.)

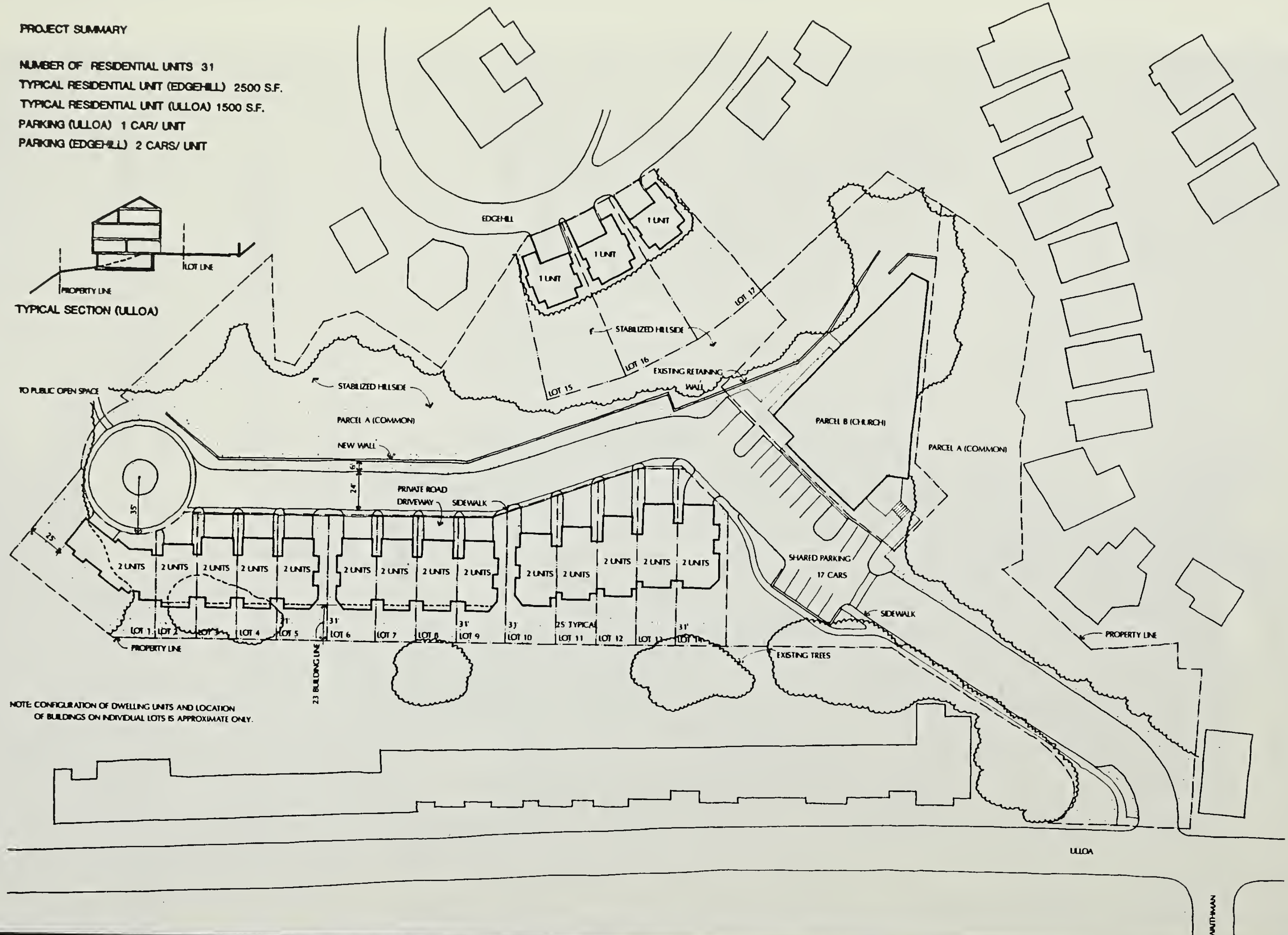
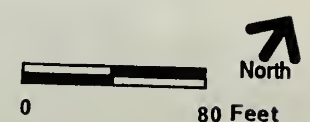


Figure 20 - Conceptual Site Plan -- Alternative C

Source: Warner Schmalz, AIA, October 1988



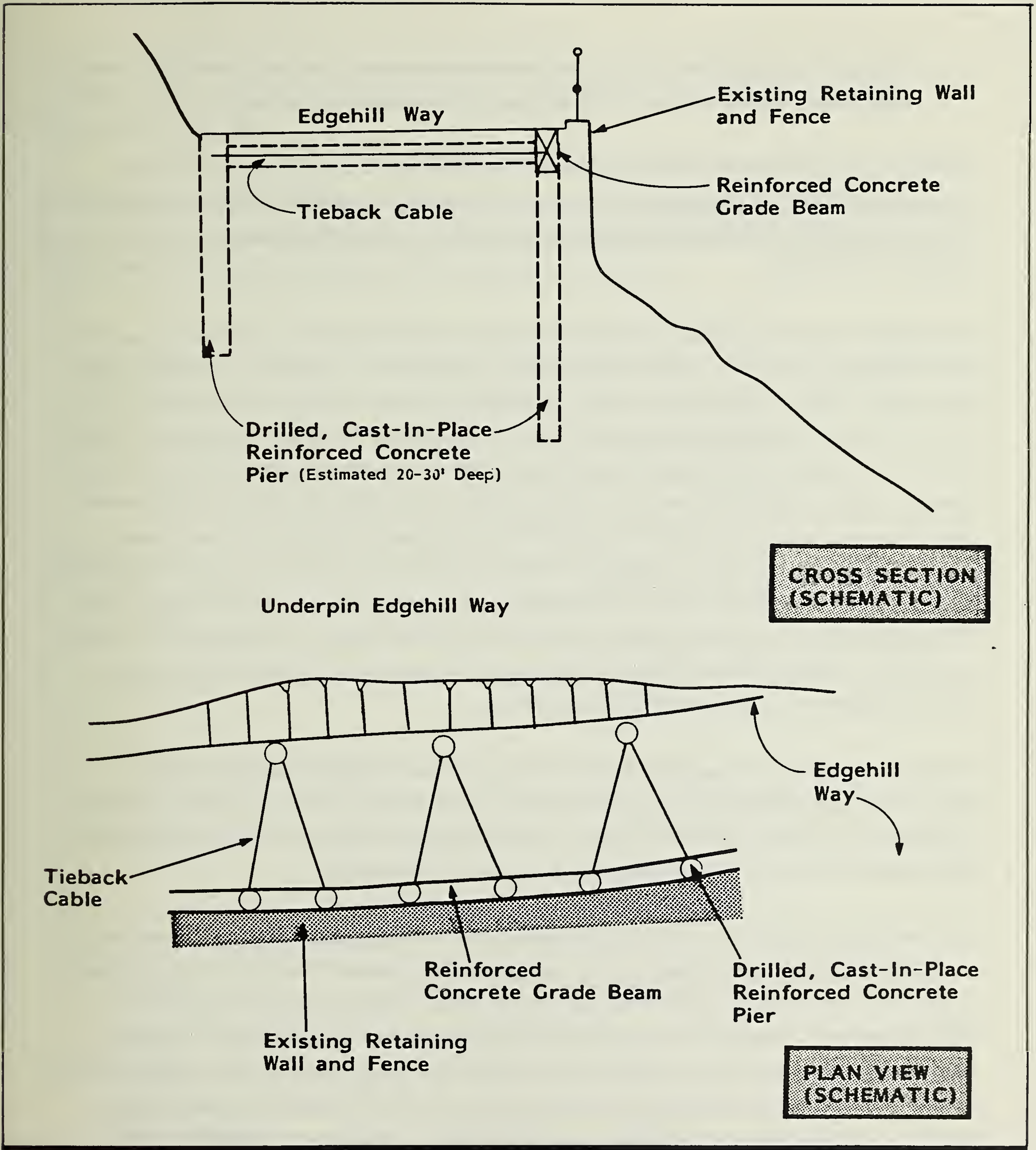


Figure 21 - Schematic Sketch -- Underpin Edgehill Way

Source: Dames & Moore

Not to Scale

- Scaling loose rocks off the prominent bedrock outcrop and installing rock bolts and wire mesh below the underpinning wall (mesh only would be draped over the rock cliff west of the wall).

Alternative C "bench" area slope stabilization generally would be similar to that required for the project; underpinning of Edgehill Way required for Alternative C would not be needed for the project which would not involve construction near Edgehill Way. Underpinning of Edgehill Way would need approval of the City's Director of Public Works.

Existing traffic conditions relevant to "bench" area development would be the same for Alternative C as for the project, except that Alternative C also would affect traffic on Edgehill Way. According to a November, 1988 traffic count on Edgehill Way near Garcia Street, Edgehill Way carries about 300 to 325 trips per day. It is a narrow, one-way, looped residential street which serves local (no through) traffic and provides access to about 36 homes. Parking on Edgehill Way is limited to one side in some locations and is prohibited entirely in other locations; on-street parking was observed to be 30% to 35% occupied during the mid-day. The street width varies from about 14 feet, adjacent to the site, to as little as 7 or 8 feet in some areas. This width would prohibit larger trucks. Assuming the 3 detached dwellings in Alternative C would have the same trip generation as the adjacent existing houses, about 27 to 30 additional daily vehicle trips would be added to Edgehill Way. This would increase the TIRE Index number of the area adjacent to the project site on Edgehill Way by slightly more than 0.1, which is above the threshold of noticeability. Alternative C would result in about 210 daily trips from development on the bench (160% of project traffic).

Construction of Alternative C would take a similar amount of time as the project. Operational noise of Alternative C would not differ noticeably from the levels expected with the project. Development on Edgehill Way primarily would occur out of the line-of-sight of existing Edgehill Way homes. Traffic-generated noise levels would be of the same approximate magnitude as those from the project.

While the bench itself does not relate visually to existing patterns of development which have occurred around the former quarry site, the visual character of the attached dwelling units under Alternative C could be viewed as similar to the attached homes built along Ulloa Street; these site units would appear to be a continuous linear building mass. Construction of the attached units without side yards under Alternative C would give development a greater visual mass compared with the project which would result in smaller, broken-up building masses. The three detached homes which would front Edgehill Way under Alternative C would be visually prominent. The existing profile of the hillside would not be broken. Underpinning of Edgehill Way under Alternative C would not be visible behind the existing Edgehill Way retaining wall, but foundation structures for the three dwelling units at that location would be visible within the surrounding area.

Alternative C would result in somewhat increased use of the adjacent City open space due to the proximity of more "bench" area units than with the project. Population density would be proportionately more than the project under Alternative C.

The sponsor is not actively considering Alternative C because, in the sponsor's opinion, neighborhood residents would not support development of 31 attached units and because the alternative would not respond to neighbors' expressed wish for development of single-family detached homes on the site.

TABLE 3
Comparison of Project and Alternatives

	Proposed Project	Alternative A	Alternative B	Alternative C
Total New Building Area a/	49,659	-	93,600	49,500
Ground Floor Footprint a/	19,950	-	27,930	20,300
Number of Units	13	-	120	31
Number of Bedrooms	52 to 65	-	120	99
Parking (spaces):				
• Garage	26	-	44	34
• Outdoor	47	-	17	17
Total Spaces	73	-	61	51

a/ Square Feet.

Source: Nichols · Berman

TABLE 4
Summary of Slope Stabilization Measures and Comparative Costs

Stabilization Element	Proposed Project	Alternative A	Alternative B	Alternative C
A Remove Loose Boulders and Install Rock Bolts	X	-	X	X
B Scale Slope of Loose Material	X	-	X	X
C Flatten/Shape Top of Slope	X	-	X	X
D Drape with Wire Mesh and Secure to Slopes	X	-	X	X
E Construct Catchment Wall	X	-	X	X
F Underpin Edgehill Way	-	-	-	X
Estimated Costs of Stabilization Measures b/	$643,700	-	$560,900	$707,700

b/ Note that Donald Hillebrandt roughly estimated stabilization to cost about $2,000,000 to $5,000,000 for a different scenario. See Chapter V, Environmental Impacts, for a discussion of Details and Costs of Stabilization Alternatives, page 53.

Source: Dames & Moore

IX. DRAFT EIR DISTRIBUTION LIST

FEDERAL AND STATE AGENCIES

Northwest Information Center California
Archaeological Inventory
Department of Anthropology
Sonoma State University
Rohnert Park CA 94928
Attn: Christian Gerike

State Office of Intergovernmental
Management
State Clearinghouse
1400 - Tenth Street
Sacramento CA 95814
Attn: Loreen McMahon

CITY AND COUNTY OF SAN FRANCISCO

Bureau of Building Inspection
450 McAllister Street
San Francisco CA 94102
Attn: Larry Litchfield
Superintendent

Landmarks Preservation Advisory Board
450 McAllister Street
San Francisco CA 94102
Attn: Vincent Marsh

Mayor's Office of Business and Economic
Development
100 Larkin Street
San Francisco CA 94102
Attn: James Ho

San Francisco City Planning Commission
450 McAllister Street
San Francisco CA 94102
Attn: Sharon Rogers
Susan Bierman
Douglas Engmann
Wayne Jackson Hu
James B. Morales, President
Edward C. Sewell
Romaine Baldridge, Alternate
Norman Karasick, Alternate

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Attn: Larry Del Carlo

Mayor's Office of Housing
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Attn: Barbara Smith

Public Utilities Commission
Bureau of Energy Conservation
110 McAllister Street
San Francisco CA 94102
Attn: John Deakin, Director

Public Utilities Commission
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San Francisco CA 94102
Attn: Thomas J. Elzey, General Manager

Recreation & Park Development
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Golden Gate Park
Fell and Stanyan Streets
San Francisco CA 94117
Attn: Deborah Learner

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Planning Division
Hall of Justice
850 Bryant Street
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Attn: Lt. Thomas W. Suttemeier

San Francisco Public Utilities Commission
425 Mason Street, 4th Floor
San Francisco CA 94102
Attn: Leonard Tom

San Francisco Real Estate Department
25 Van Ness Avenue, 4th Floor
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Attn: Mr. Tony Delucchi
Director of Property

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San Francisco Department of Public Works
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Martin Lieberman, Manager CDD

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Edgehill Way Association
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Forest Hills Association
John Gathen, President
1975 -- 25th Avenue
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Greater West Portal Neighborhood Association
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Ms. Janet Coates
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53 Rockwood Court
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Ms. Lillian Fry
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Robert and Gleiter Schuman
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Ms. Carol DeVincenzi
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Mr. Frank Couper
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Harvard and Gertrude Harper
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Joseph and Catherine Gelvin
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Mr. Franklin Lau
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Mr. Clarence Esposto
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Dana Huff
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George and Celia Wong
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Mary and Daniel Callaghan
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Arthur and Ruth Mullins
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245 Edgehill Way
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Associated Press
1390 Market Street, Suite 318
San Francisco CA 94102
Attn: Bill Shiffman

Leland S. Meyerzone
KPOO-FM
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San Francisco CA 94101

San Francisco Bay Guardian
2700 - Nineteenth Street
San Francisco CA 94110
Attn: Patrick Douglas, City Editor

San Francisco Business Times
325 Fifth Street
San Francisco CA 94107
Attn: Tim Turner

San Francisco Chronicle
925 Mission Street
San Francisco CA 94103
Attn: Martin Halstuk
Dawn Garcia

Department of Housing and
Community Development Library
P. O. Box 952055
Sacramento CA 94252-2055

San Francisco Examiner
P. O. Box 7260
San Francisco CA 94120
Attn: Gerald Adams

The Sun Reporter
1366 Turk Street
San Francisco CA 94115

Tenderloin Times
146 Leavenworth Street
San Francisco CA 94102
Attn: Rob Waters

LIBRARIES

Document Library
City Library - Civic Center
San Francisco CA 94102
Attn: Faith Van Liere

Environmental Protection Agency Library
215 Fremont Street
San Francisco CA 94105
Attn: Jean Circiello

Stanford University Libraries
Jonsson Library for Government Documents
State and Local Documents Division
Stanford CA 94305

Government Publications Department
San Francisco State University
1630 Holloway Avenue
San Francisco CA 94132

Hastings College of the Law - Library
200 McAllister Street
San Francisco CA 94102-4978

Institute of Government Studies
109 Moses Hall
University of California
Berkeley CA 94720

Alice Barkley
Mills Building, Suite 691
220 Montgomery Street
San Francisco CA 94104

X. APPENDICES

APPENDIX A

Initial Study

File No.: 87.399EC
Address: 300 Ulloa Street

SAN FRANCISCO

CITY PLANNING COMMISSION

MOTION NO. 11393

ADOPTING FINDINGS RELATED TO THE APPEAL OF THE NEGATIVE DECLARATION, FILE NUMBER 87.399EC FOR THE PROPOSED DEVELOPMENT ("PROJECT") AT 300 ULLOA STREET

MOVED, That the San Francisco City Planning Commission ("Commission") hereby SUSTAINS the appeal of the Department of City Planning's decision to issue a Negative Declaration, based on the following findings:

1. On December 24, 1987, pursuant to the provisions of the California Environmental Quality Act ("CEQA"), the State CEQA Guidelines, and Chapter 31 of the San Francisco Administrative Code, the Department of City Planning ("Department") received an Environmental Evaluation Application form for the Project, in order that it might conduct an initial evaluation to determine whether the Project might have a significant impact on the environment.

2. On April 29, 1988, the Department determined that the Project, as proposed, could not have a significant effect on the environment.

3. On April 29, 1988, a notice of determination that a Preliminary Negative Declaration would be issued for the Project was duly published in a newspaper of general circulation in the City, and the Preliminary Negative Declaration posted in the Department offices and mailed to the project sponsor, all in accordance with law.

4. On May 3, 1988, an appeal of the decision to issue a Negative Declaration was timely filed by Helen Barkley, President of the Greater West Portal Neighborhood Association.

5. On May 26, 1988, the Commission held a duly noticed and advertised public hearing on the appeal of the Negative Declaration, at which testimony on the merits of the appeal, both in favor of and in opposition to, was received. The Commission also held duly noticed and advertised public hearings on the appeal of the Negative Declaration on June 9 and July 7, 1988.

6. Staff memoranda, dated May 19, June 9, and July 1, 1988, have been prepared which address and respond to several points raised by appellant in the appeal letter and in subsequent submittals to the City Planning Commission. These memoranda are incorporated by reference herein. Copies of these memoranda have been delivered to the City Planning Commission, and copies of these memoranda are on file and available for public review at the Department of City Planning, 450 McAllister Street. These memoranda, along with other data in the Initial Study and in the file, provide the basis for focusing further environmental analysis on the following issues:

Geology: further environmental analysis will focus on plans for the stabilization of the hillside above the proposed development site. Project alternatives will consider the slope stabilization parameters recommended by project geotechnical consultants and those recommended by Mr. Donald Hillebrandt, a geotechnical consultant familiar with the conditions on the project site.

Transportation: further environmental analysis will focus on project transportation impacts and the methodologies used by both consultants to reach their respective conclusions on environmental effects.

Visual: visual effects otherwise appropriately discussed during the consideration of the project's Conditional Use authorization application will be analyzed as part of the environmental analysis.

Population: the introduction of residents, employees and visitors associated with the proposed project to the surrounding residential neighborhood will be further discussed.

Noise: Noise aspects of the project will be considered.

Open Space: Any effects of the proposed project and alternatives on the adjacent open space under the jurisdiction of the Recreation and Park Department will be analyzed.

Alternatives: further environmental review will result in an analysis of alternatives to the project, including a similar but smaller residential care use than presently proposed, alternative uses for the site permitted within the existing zoning regulations (including single-family homes), the geotechnical alternatives discussed above and a "no project" alternative.

7. In reviewing the Negative Declaration issued for the Project, the Commission has had available for its review and consideration all information pertaining to the project in the Department's case file.

DECISION

The City Planning Commission HEREBY DOES FIND that the proposed Project could have a significant effect on the environment, and HEREBY DOES SUSTAIN the appeal of the Department of City Planning's decision to issue a Negative Declaration and hereby finds that an Environmental Impact Report focusing on geology, transportation, visual, population, noise and open space impacts is required.

I hereby certify that the foregoing Motion was ADOPTED by the City Planning Commission at its regular meeting of July 7, 1988.

Lori Yamauchi
Secretary

AYES: Commissioners Bierman, Boldridge, Dick, Engmann, Hu, Karasick and Morales

NOES: None

ADOPTED: July 7, 1988

IMC174

NEGATIVE DECLARATION

Date of Publication of
Preliminary Negative Declaration: April 29, 1988, as amended on May 23 and July 1, 1988

Lead Agency: City and County of San Francisco, Department of City Planning
450 McAllister Street, 5th Floor, CA 94102

Agency Contact Person: Ivan M. Christie Telephone: (415) 558-6386

Project Title: 87.399EC
Residential Care Facility

Project Sponsor: Urban Holdings, Inc.
Project Contact Person: Bill Morris

Project Address: 300 Ulloa Street, north side near Walthman Way

Assessor's Block(s) and Lot(s): Lot 7 in Assessor's Block 2876

City and County: San Francisco

Project Description: Proposed construction of a three to four-story 80,100 square foot residential care facility which would contain 108 rental rooms, with 61 off-street parking spaces provided; the project is proposed as a Planned Unit Development subject to Conditional Use authorization by the City Planning Commission and includes the subdivision of Lot 7 into two lots.

Building Permit Application Number, if Applicable: Not Yet Filed

THIS PROJECT COULD NOT HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT. This finding is based upon the criteria of the Guidelines of the State Secretary for Resources, Sections 15064 (Determining Significant Effect), 15065 (Mandatory Findings of Significance) and 15070 (Decision to Prepare a Negative Declaration), and the following reasons as documented in the Initial Evaluation (Initial Study) for the project, which is attached:

The proposed project is the construction of a residential care facility on the site of the First Church of the Nazarene at 300 Ulloa Street, the north side immediately west of Waithman Way, Lot 7 in Assessor's Block 2876. The project would consist of 108 rental rooms in a three and four-story building above a basement level garage. A total of 61 off-street parking spaces would be provided on the site, 49 more than presently exist on the site. Of this total, 21 spaces would be provided for the project. The remaining 40 spaces would be provided for the existing church, which would remain on the site upon project completion. The project sponsors are requesting consideration of the proposal by the City Planning Commission as a Planned Unit Development. The proposal includes the subdivision of Lot 7 into two lots.

According to the project sponsors, the project is proposed to serve as a residential care facility for people with limited ambulatory ability who are

-Over-

Mitigation measures, if any, included in this project to avoid potentially significant effects:

See page 7

Final Negative Declaration adopted and issued on ______________________

cc: Robert Passmore
Larry MacDonald
Distribution List
Paul Rosetter
Bulletin Board
Master Decision File

BARBARA W. SMITH
Environmental Review Officer

BWS:IMC:emb
IMC:149

able to live moderately independent lives with basic assistance. Residential care facilities require a license from the State, may only serve residents 62 years of age or older, and provide full meal service, laundry service and a full activities program. The facility would consist of studio, one-bedroom and a few two-bedroom rental rooms, designed primarily for single residents, although a small percentage of the units would accommodate couples. The number of residents at full occupancy would be approximately 130 people. There would be no infirmary; nursing care would not be provided. The residential rooms would not contain kitchens as the facility would have a centrally-located dining room. Common areas devoted to a living room, library, smoking room, chapel, crafts room and beauty parlor would be provided. A portion of the ground floor would be used for administrative offices. A housekeeping staff of approximately 26 people would be employed on the site, although it is expected that a maximum of 15 employees would be working on the site at any one time.

The project building would contain approximately 80,100 square feet (covering roughly 23% of the site), and would be divided into approximately 67,600 square feet of residential use, 13,560 square feet of basement parking, and 12,500 square feet of common area. The building's basement level would contain 45 parking spaces; the 17 remaining project off-street parking spaces would be provided outside the building. According to the project sponsors, the building is designed to present the appearance of a series of buildings above the ground floor basement, with its elevation divided into modules. The building would have an average height of 30 feet.

The site is an approximately 3.3 acre irregularly-shaped lot within an RH-1-(D) (Single-Family Detached) zoning district and 40-X height and bulk district. It was formerly used as a quarry (long since abandoned) and contains steep hillsides above and below a graded horizontal bench approximately 100-150 feet in width (the proposed location of the project). The hillside above this bench rises to a height of 125 feet at its highest point, with vertical slopes in some areas. Single-family homes fronting Edgehill Way sit at the top of this hill. Rockfalls have occurred on the site, most notably in 1967 and 1978, and evidence of this activity can be clearly seen. Steeply cut slopes exist below the site's southern and southwestern property lines, above and behind a row of single-family dwellings which front the 300 block of Ulloa Street. The graded bench is essentially void of trees, but parts of the slope above and below the site contain substantial amounts of scotch broom and other shrubbery as well as eucalyptus and fir trees; parts of the slope above the site are barren. The 7,500 square foot Church of the Nazarene, recently rehabilitated, sits on the eastern portion of the graded bench and would remain upon project completion. Playground equipment and asphalt areas to accommodate ten delineated church parking spaces comprise the rest of the uses on the site. Access to the site is via a driveway extending upward from the southeast corner of the lot at Ulloa Street near Waithman Way.

The surrounding area is residential in character and consists of single-family dwellings within an RH-1-(D) district. Four single-family dwellings are presently under construction immediately east of the project's driveway on Ulloa Street. The West Portal Neighborhood Commercial District lies approximately five blocks southwest of the site. The St. Brendan's Church and School lie one block to the east along Ulloa Street. Portola Drive, a major east/west thoroughfare, lies one block to the south. Adjacent to the site to the west and immediately behind the row of single-family dwellings fronting Kensington Way lie lots that have been recently purchased by the City for preservation as Open Space. These lots contain dense low-growth shrubbery and dense stands of eucalyptus.

The project would be subject to Conditional Use authorization by the City Planning Commission. Residential uses permitted as-of-right within an RH-1-(D) district include single-family homes with side yards as required by Section 133 of the City Planning Code; dwellings designed specifically for and occupied by senior citizens or physically-handicapped persons at a density not exceeding twice the number of single-family units permitted on the site; residential care facilities providing lodging, board and care for no more than six persons; and a child care facility for 12 or fewer children. Uses permitted by Conditional Use authorization include residential care facilities for seven or more persons and child care facilities for 13 or more children.

The project is proposed as a Planned Unit Development (PUD) under Section 304

of the City Planning Code. Consideration of a project as a PUD is provided for sites greater than 1/2 acre in size. As stated in the City Planning Code, the objectives of a PUD are to develop a project "...as integrated units...designed to produce an environment of stable and desirable character which will benefit the occupants, the neighborhood and the City as a whole...". Although the project would be larger in scale than the residences in the surrounding area, the nature of the project's use combined with the location of the site would not substantially impact the existing character of the vicinity. The project would be set back from Ulloa Street and would not disrupt nor divide the physical arrangement of the surrounding area.

The 143,600 square foot site is proposed to be subdivided from one lot into two. Parcel A would contain the proposed residential care facility and would contain 125,600 square feet. Parcel B would consist of the remaining 18,000 square feet of the existing lot and would contain the existing church building. The proposed subdivision would require review and approval from the Department of Public Works.

A transportation study prepared for an earlier 115-bedroom proposal was prepared by an independent consultant and is available for public review in the offices of the Department of City Planning, 450 McAllister Street. The results of the study are summarized herein.

Ulloa Street, Waithman Way and Portola Drive are the most important streets that serve the site. Ulloa Street is one-way eastbound, Waithman Way is a two-lane, two-way street, and Portola Drive is a four-lane street containing a median strip which prevents left turns onto Portola from Waithman. Intersections in the vicinity are generally controlled by "STOP" signs. The intersections of Laguna Honda Blvd./Portola Drive and Portola Drive/Miraloma-Marne are signalized. Existing traffic conditions in the area are within acceptable levels of service during the a.m. and p.m. peak hours and are generally light throughout the day. Traffic on Ulloa may be occasionally stopped in front of St. Brendan's School during school drop-off and pick-up times, but this condition generally does not occur during the citywide peak periods. Traffic accident rates have been low relative to the volume of area traffic.

The project would generate a minimal traffic impact on the surrounding streets. The study noted that determining the vehicle trip generation for facilities like the proposed project is difficult to quantify. Auto ownership and use depend on such factors as age, income, the availability of transit and the availability of commercial uses within walking distance. Eight facilities similar to that of the project, located in San Francisco or elsewhere in the Bay Area, were surveyed and compared with previous studies of other similar facilities. Based on these analyses, a maximum vehicle trip generation rate was developed which included not only project residents but staff, visitors, truck deliveries, and a proposed van shuttle that would be provided for project residents to serve specific purposes such as shopping and doctor's appointments. The study found that the project could typically generate 92 round trips per weekday, with a potential maximum of 196 round trips per weekday. During the peak p.m. hour (5:00-6:00), the study estimates the project could typically generate 8 one-way trips, with a potential maximum of 35 one-way trips. The project would not substantially affect area traffic. Maximum traffic effects associated with the church use is generally confined to Sundays, when area traffic levels are lower, and would not be cumulatively considerable when combined with Sunday traffic impacts generated by the project.

Access to the site would be primarily via Waithman Way. The intersection of Ulloa Street and Waithman Way is a "T" intersection. The project's driveway is immediately to the west of this intersection, forcing those vehicles entering the site from Waithman to turn against eastbound traffic on Ulloa in order to enter the site. The project sponsor has requested the City's Traffic Engineering Bureau to reposition "STOP" signs and markings at the Ulloa/Waithman intersection in order to develop a suitable junction which would allow project-bound vehicles from Waithman to enter the site safely. It is within the purview of the Traffic Engineering Bureau to develop such a junction; the Bureau has indicated its preliminary approval of the project sponsor's request. This would facilitate access to the site by those vehicles

traveling from the north or east, and those south or westbound vehicles exiting the site, to use Portola Drive via Walthman. Because of the median along Portola Drive, vehicles exiting the site and traveling north or eastbound would be required to travel up Ulloa Street to Laguna Honda Blvd. Vehicles traveling to the site from the south or west would typically approach the site via Ulloa. The project's traffic distribution would not substantially affect area traffic conditions.

Should the repositioning of STOP signs and other changes at the Ulloa/Walthman intersection not occur, vehicles travelling to and from the site would have to use Ulloa Street. While traffic on Ulloa would increase under this scenario, the number of vehicles associated with the project that would be introduced onto the street would not significantly affect traffic operations and existing levels of service in the surrounding area, given present conditions. Some vehicles would be expected to access the site via Walthman Way whether the intersection alterations occur or not.

Parking impacts associated with the project would similarly not be considerable. Under the City Planning Code, the project would be required to provide a maximum of 14 off-street spaces, compared with the 21 proposed to be provided. An additional 40 spaces would be provided for the church use for a total of 61 spaces on the site. As noted above, the site presently contains about 10 designated off-street parking spaces, although the existing site conditions can accommodate a larger number of parking spaces. Because of the limited use of the church building, vehicles associated with the project could use a portion of the 40 church-designated spaces for parking. The traffic study noted that under a maximum impact scenario, some parishioners would have to use on-street parking spaces on Sundays. The likelihood of this condition occurring would be minimal, however.

The traffic study estimates that the project could generate a maximum of two truck trips per day, based on information supplied by the project sponsor and on results from the study's survey of similar facilities. Although the City Planning Code would not require the provision of a truck loading space on the site, the project would contain one off-street truck loading space. The project would provide a turning area to allow trucks to maneuver within the site. Most deliveries would be in vans or single-unit trucks. It does not appear that large semi-tractor/trailer trucks would be necessary to serve the site. These kinds of trucks may be necessary during some phases of project construction; however, substantially more truck maneuvering space would be available during project construction.

Transit service in the area consists of the 43 and 48 lines, both of which travel within approximately one block of the site, and MUNI Metro lines available at the nearby West Portal station. The project would have a minimal impact on area transit operations.

The proposed project would increase demand for and use of public services and utilities on the site and increase water and energy consumption, but not in excess of amounts expected and provided for in this area.

Title 25 of the California Government Code establishes uniform noise insulation standards for residential projects. The Bureau of Building Inspection would review the final building plans to ensure that the building wall and floor/ceiling assemblies meet State standards regarding sound transmission.

An evacuation and emergency response plan shall be developed by the project sponsor or building management staff, in consultation with the Mayor's Office of Emergency Services, to ensure coordination between the City's emergency planning activities and the project's plan and to provide for building occupants in the event of an emergency. The project's plan shall be reviewed by the Office of Emergency Services and implemented by building management insofar as feasible before issuance of final building permits by the Department of Public Works.

Demolition, construction and operating noise impacts generated by the project would be controlled by the San Francisco Noise Ordinance and, consequently, would not substantially increase noise levels above those in the area.

Demolition and construction activity would temporarily raise dust levels in the area, but not to a level that would have significant impacts upon air quality. The project sponsor would be required and has agreed to water the site twice daily during project construction, to reduce dust emissions.

The project would require the removal of approximately 35 trees as part of project construction, primarily on the western end of the site. Removal of these trees would not substantially diminish the amount of trees in the immediate vicinity of the project nor substantially affect the City open space adjacent to west. Trees would remain on the project's southwestern slope to act as a buffer between the project building and those residences fronting Ulloa Street. Additionally, the project sponsor has proposed to plant about 35 trees as part of the project. There are no known rare or endangered plant or animal species on the site. The open space adjacent to the site is protected by the City's Park Shadow Ban Ordinance. Although the project may cast shadow on this open space during portions of sunlit days, the project's 40-foot height limit would exempt it from the restrictions of this ordinance.

The project would not displace a large number of people nor would it create a substantial demand for additional housing in San Francisco. As discussed above, the impacts associated with the increase in population on the site would not be substantial and would not induce substantial population growth in the area.

A number of geotechnical reports have been prepared for the site by independent consultants over the past several years. Most notable are studies prepared by Don Hillebrandt and Associates in June, 1981 (for a previous 42-unit condominium proposal) and September, 1987, and a study by Dames & Moore in November, 1987. These three reports and others prepared for the site are available for public review in the offices of the Department of City Planning. The findings of these reports are included herein.

As stated in the 1981 Hillebrandt investigation, the site is underlain by Franciscan Chert Bedrock, a rock type found throughout San Francisco. As stated above, the site has been subject to periodic rockfall activity during its recent history; the last significant slide activity on the site occurred in 1978. As a result of the slides at that time, the City's Bureau of Building Inspection required mitigation measures to be implemented on the slope behind the church and suspended the use of the site for church activities until satisfied that those measures had been completed. The church building was not permitted to reopen until September, 1987, after all required stabilization/protection work to ensure slope stability behind the church building had been completed. The work performed included the removal of large rocks, installation of rock bolts and galvanized double-twisted wire mesh onto the slope, and the construction of an eight-foot high, heavily reinforced retaining wall immediately behind the north side of the church building.

The slope behind the project site is presently unstable and would be subject to similar stabilization work as was completed on the slope behind the church. The Hillebrandt report considered two ways to control rockslide activity on the slopes above the site. The most desirable option would be to completely stabilize the entire hillside. This proposal was rejected by the engineering consultants as being extremely difficult and dangerous to perform. The alternative recommended, as stated by Hillebrandt, "...would not attempt to retain the hillside but would accommodate potential future rockfalls and sloughing/ravelling by a protective wall and fence system that would yield and possibly fail (i.e. weakened to a point where it could no longer function as a retaining wall) in the event of a major rockslide (resulting either from a large-magnitude earthquake or heavy rainfall) but would still protect life and occupied building space."

The Dames & Moore report, which incorporated the analysis of the Hillebrandt study, contains several recommendations for slope stability and concludes that the project "...is feasible from a geotechnical standpoint." According to Dames & Moore, "the essentially vertical cliff of massive chert (on a portion of the slope above the proposed project) appears to be the most dangerous portion of the existing slope". The recommendations include: flattening the top portion of the chert cliff, removing loose rock masses where possible and rock-bolting the remaining rock mass. These measures are recommended to take

place prior to the following measures: removal of partially buried chert boulders; stabilization of the existing unstable condition of the rock immediately beneath Edgehill Way by underpinning that roadway with a pier and grade beam system; controlling erosion activity and/or shallow sloughing activity in the western area of the site through grooming to achieve a gradual slope; scaling the surface to remove weaker materials; and covering the slope with a wire mesh. In addition, a catchment/retaining wall is recommended for construction at the final toe of the slope (after removal of loose rock materials). In response to the latter consultant recommendation, the project sponsor proposes to build an approximately 325-foot concrete catchment wall approximately ten feet in height which would extend along the base of the slope behind the proposed facility. A 10-15 foot buffer zone would be provided between the toe of the slope and portions of the building, the catchment wall being constructed at the final toe site. The net effect of all of these recommended measures is achieve greater stability of the slopes above the project site than presently exists; project construction by itself would not destabilize Edgehill Way nor further destabilize the above hillside.

In the opinion of the geotechnical consultants, the recommended mitigation measures would adequately protect the proposed development. However, both Hillebrandt and Dames & Moore state that raveling of thinly bedded chert rock above the project site will continue. As a result, both consultants recommend that a long-term maintenance program be established for the development. This would include the allocation of appreciable funds to (1) clean-up rock debris from any future rockfalls and/or ravelling/sloughing slopes, (2) repair and/or replace protective walls should they become damaged for any reason, and (3) maintain trees and vegetation on slopes". Additionally, Hillebrandt states that "surface water runoff must be carefully controlled at the site...(and) directed...away from the slopes to the south and southwest of the site". Retaining walls constructed are also recommended to be well-drained.

The recommendations offered in the Dames & Moore opinions, which incorporated the earlier Hillebrandt analysis, are hereby incorporated by reference as mitigation measures in this environmental analysis. Therefore, these mitigation measures would be incorporated as conditions of project approval by the City Planning Commission, should the Commission decide to approve the project as proposed or approve a modified version. Additionally, should the project be approved by the City Planning Commission, the Bureau of Building Inspection (BBI) would review the final building plans as well as the geotechnical studies. In reviewing building plans, the BBI refers to a variety of information sources to determine existing hazards and assess requirements for mitigation. Sources reviewed include maps of Special Geologic Study Areas and known landslide areas in San Francisco as well as building inspectors' working knowledge of areas of special geologic concern. The above-referenced geotechnical investigation(s) would be available for use by the BBI during its review of builidng permits for the site. The BBI could require that additional site-specific soils reports be prepared in conjunction with permit applications, as needed. In addition, the BBI has the right to impose additional measures it may feel necessary to ensure that the project can be constructed safely. The BBI also has the right to revoke the project's use permit any time in the future if it believes that the lives of people on the site are in danger as a result of an ineffective slope stabilization maintenance program.

Neighborhood concerns about the stability of the slope below the project site and immediately above the residences fronting Ulloa Street are addressed in opinions by both Hillebrandt and Dames & Moore. Both of these independent consultants believe that the construction of the project on the graded bench would not adversely affect the slope behind the Ulloa Street homes nor those homes along Edgehill Way. Excavation and filling during project construction would be minor and the project buildings would be lightly-loaded i.e. the weight of the buildings themselves would not be so great as to jeopardize slope stability. Water runoff from both the project pad and the hillside above the pad would be collected and transported directly to the City sewer system, which would reduce the amount of water runoff presently affecting the site's southern slopes.

In November, 1986, the voters of San Francisco approved Proposition M, the "Accountable Planning Initiative", which establishes eight Priority Policies. These policies are: preservation and enhancement of neighborhood-serving retail uses; protection of neighborhood character; preservation and enhancement of affordable housing; discouragement of commuter automobiles: protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership; earthquake preparedness; landmark and historic building preservation; and protection of open space. Prior to issuing a permit for any project which requires an Initial Study under CEQA or adopting any zoning ordinance or development agreement, the City is required to find that the proposed project or legislation is consistent with the Priority Policies.

While local concerns or other planning considerations may be grounds for modification or denial of the proposal, there is no substantial evidence that the project could have a significant effect on the environment.

MITIGATION MEASURES INCLUDED AS PART OF THE PROJECT:

1. GEOLOGY: The project sponsor would follow the recommendations of the geotechnical reports referenced in the above text. These recommendations include but are not limited to the following:

   a. Loose rock masses would be removed where possible; remaining rock mass would be rock-bolted.

   b. Partially-buried chert boulders would be removed.

   c. The top portion of the chert cliff would be flattened.

   d. The portion of Edgehill Way above the site would be stabilized by underpinning that roadway with a pier and grade beam system.

   e. The surface of the slope above the site would be scaled to remove weaker materials.

   f. Erosion activity and/or shallow sloughing activity in the western area of the site would be controlled through grooming to achieve a gradual slope.

   g. The slope above the site would be covered with a wire mesh

   h. A catchment/retaining wall would be constructed at the base of the slope.

   i. A 10-15 foot buffer zone would be provided between the final toe of the slope (after removal of loose rock materials) and portions of the building, with a catchment wall constructed at the final toe site.

   j. A maintenance program to ensure the safety of project residents from potential slope failure or periodic minor rock falls would be implemented by the managers of the proposed facility, which would include the allocation of appreciable funds to (1) clean-up rock debris from any future rockfalls and/or ravelling/sloughing slopes, (2) repair and/or replace protective walls that are damaged, and (3) maintain trees and vegetation on slopes.

2. Such additional measures as may be imposed by the Bureau of Building Inspection.

IMC149:emb

ENVIRONMENTAL EVALUATION CHECKLIST
(Initial Study)

File No: 87.399EC Title: Residential Care Facility

Street Address: 300 Ulloa Street Assessor's Block/Lot: 2876/07

Initial Study Prepared by: Ivan H. Christie

A. COMPATIBILITY WITH EXISTING ZONING AND PLANS	Not Applicable	Discussed
1) Discuss any variances, special authorizations, or changes proposed to the City Planning Code or Zoning Map, if applicable.	—	✓
*2) Discuss any conflicts with any adopted environmental plans and goals of the City or Region, if applicable.	✓	—

B. ENVIRONMENTAL EFFECTS - Could the project:	YES	NO	DISCUSSED
1) Land Use			
*(a) Disrupt or divide the physical arrangement of an established community?	—	✓	✓
*(b) Have any substantial impact upon the existing character of the vicinity?	—	✓	✓
2) Visual Quality			
*(a) Have a substantial, demonstrable negative aesthetic effect?	—	✓	—
(b) Substantially degrade or obstruct any scenic view or vista now observed from public areas?	—	✓	—
(c) Generate obtrusive light or glare substantially impacting other properties?	—	✓	—
3) Population			
*(a) Induce substantial growth or concentration of population?	—	✓	✓
*(b) Displace a large number of people (involving either housing or employment)?	—	✓	✓
(c) Create a substantial demand for additional housing in San Francisco, or substantially reduce the housing supply?	—	✓	✓
4) Transportation/Circulation			
*(a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system?	—	✓	✓
(b) Interfere with existing transportation systems, causing substantial alterations to circulation patterns or major traffic hazards?	—	✓	✓
(c) Cause a substantial increase in transit demand which cannot be accommodated by existing or proposed transit capacity?	—	✓	✓
(d) Cause a substantial increase in parking demand which cannot be accommodated by existing parking facilities?	—	✓	✓
5) Noise			
*(a) Increase substantially the ambient noise levels for adjoining areas?	—	✓	✓
(b) Violate Title 24 Noise Insulation Standards, if applicable?	—	✓	✓
(c) Be substantially impacted by existing noise levels?	—	✓	✓

* Derived from State EIR Guidelines, Appendix G, normally significant effect.

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	YES	NO	DI.
6) Air Quality/Climate			
*(a) Violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation?	—	✓	✓
*(b) Expose sensitive receptors to substantial pollutant concentrations?	—	✓	—
(c) Permeate its vicinity with objectionable odors?	—	✓	—
(d) Alter wind, moisture or temperature (including sun shading effects) so as to substantially affect public areas, or change the climate either in the community or region?	—	✓	✓
7) Utilities/Public Services			
*(a) Breach published national, state or local standards relating to solid waste or litter control?	—	✓	—
*(b) Extend a sewer trunk line with capacity to serve new development?	—	✓	—
(c) Substantially increase demand for schools, recreation or other public facilities?	—	✓	—
(d) Require major expansion of power, water, or communications facilities?	—	✓	✓
8) Biology			
*(a) Substantially affect a rare or endangered species of animal or plant or the habitat of the species?	—	✓	✓
*(b) Substantially diminish habitat for fish, wildlife or plants, or interfere substantially with the movement of any resident or migratory fish or wildlife species?	—	✓	—
(c) Require removal of substantial numbers of mature, scenic trees?	—	✓	✓
9) Geology/Topography			
*(a) Expose people or structures to major geologic hazards (slides, subsidence, erosion and liquefaction).	—	✓	✓
(b) Change substantially the topography or any unique geologic or physical features of the site?	—	✓	✓
10) Water			
*(a) Substantially degrade water quality, or contaminate a public water supply?	—	✓	—
*(b) Substantially degrade or deplete ground water resources, or interfere substantially with ground water recharge?	—	✓	—
*(c) Cause substantial flooding, erosion or siltation?	—	✓	—
11) Energy/Natural Resources			
*(a) Encourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner?	—	✓	—
(b) Have a substantial effect on the potential use, extraction, or depletion of a natural resource?	—	✓	—
12) Hazards			
*(a) Create a potential public health hazard or involve the use, production or disposal of materials which pose a hazard to people or animal or plant populations in the area affected?	—	✓	—
*(b) Interfere with emergency response plans or emergency evacuation plans?	—	✓	✓
(c) Create a potentially substantial fire hazard?	—	✓	—
13) Cultural			
*(a) Disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group; or a paleontological site except as a part of a scientific study?		✓	
(b) Conflict with established recreational, educational, religious or scientific uses of the area?	—	✓	—
(c) Conflict with the preservation of buildings subject to the provisions of Article 10 or Article 11 of the City Planning Code?	—	✓	—

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C. OTHER

	YES	NO	DISCUSSED
Require approval and/or permits from City Departments other than Department of City Planning or Bureau of Building Inspection, or from Regional, State or Federal Agencies?	✓	___	___

D. MITIGATION MEASURES

	YES	NO	N/A	DISCUSSED
1) If any significant effects have been identified, are there ways to mitigate them?	✓	___	___	✓
2) Are all mitigation measures identified above included in the project?	✓	___	___	✓

E. MANDATORY FINDINGS OF SIGNIFICANCE

	YES	NO	DISCUSSED
*1) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or pre-history?	___	✓	___
*2) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	___	✓	___
*3) Does the project have possible environmental effects which are individually limited, but cumulatively considerable? (Analyze in the light of past projects, other current projects, and probable future projects.)	___	✓	___
*4) Would the project cause substantial adverse effects on human beings, either directly or indirectly?	___	✓	___

F. ON THE BASIS OF THIS INITIAL STUDY

____ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared by the Department of City Planning.

_✓_ I find that although the proposed project could have a significant effect on the environment, there there WILL NOT be a significant effect in this case because the mitigation measures, numbers/1+2, in the discussion have been included as part of the proposed project. A NEGATIVE DECLARATION will be prepared.

____ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Barbara W. Sahm

BARBARA W. SAHM
Environmental Review Officer
for

DEAN L. MACRIS
Director of Planning

DATE: 4/29/88

BWS:eh
OER:23

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APPENDIX B

Transportation [1]

PROJECT-GENERATED TRAFFIC IMPACTS

Traffic Impacts on the Residential Environment

Project site neighbors have expressed concerns about adding traffic to the 200-block of Ulloa Street between Waithman Way and Laguna Honda Boulevard, the primary location where parents drop-off and pick-up students at St. Brendan's School. While the ADT of 1,081 trips is considered low for a residential street, short peaks occur when parents transporting children arrive at or leave the school. (During these peaks, limited street frontage for parking or waiting vehicles also contributes to traffic delays.)

During a 24-hour period, the project would generate an estimated 130 vehicle trips, half of which would be inbound (65) and half outbound (65). Only outbound traffic leaving the site (none inbound) could use the 200-block of Ulloa Street, since it is one way, and, of all outbound traffic, 45% would be expected to use this block (with 55% using Waithman Way). Of the approximately 29 daily trips the project is expected to add to the 200-block of Ulloa Street, 5 to 6 trips would be made in the peak school hour between 2:00 and 3:30 PM.

Methodological Considerations

Little attention has been given to the impact of traffic on residential street environments in standard traffic handbooks and texts which do not contain quantitative methods for analyzing the impacts from changes in traffic volume, although several reports and articles have been published. [2] The lack of engineering interest in this topic may be due to the difficulty of establishing objectively "how much traffic is too much" on a residential street while physical (engineering) capacity is an observable quantity which can be established using scientific methods. The maximum of number of vehicles acceptable in a residential environment is a subjective, psychological value which this not well understood.

Colin Buchanan's 1963 study, Traffic in Towns, is one of the earliest attempts to establish the "environmental capacity" (his term) of a street. Buchanan proposed simple methods for assessing environmental capacity, based primarily on the danger to people who wish to cross the street. An average delay to all crossing pedestrians of two seconds was identified as the rough borderline between acceptable and unacceptable conditions, although this value was not supported by interviews or other factual data. Three other considerations include the vulnerability of crossing pedestrians (young and old), the physical condition of the road, and the general level of pedestrian activity. For areas with large numbers of children, Buchanan suggested that "acceptable" traffic volumes should not exceed about 75 to 90 vehicles per hour. He also noted the importance of speed in residential street environments, stating that "vehicle speeds in excess of 20 MPH were incompatible with the needs of pedestrians and the environment generally".

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1 Appendix B is extracted from the report, "Traffic Study, 300 Ulloa Street Residential Project (Residential Care Facility), City & County of San Francisco, A Report to the Department of City Planning", prepared by DKS Associates, the EIR traffic consultant, December 23, 1988; the study is in the project file at the Department of City Planning, 450 McAllister Street, San Francisco.

2 Salem Spitz, "How Much Is Too Much (Traffic)", ITE Journal, May, 1982; Federal Highway Administration, "Improving the Residential Street Environment", Mau, 1981; Donald Appleyard, "Environmental Quality of City Streets: The Residents' Viewpoint", Highway Research Record 352m 1971; Colin Buchanan, Traffic in Towns, 1963; and Donald Appleyard, Livable Streets, 1981.

Donald Appleyard of the University of California, Berkeley, continued Buchanan's work with extensive interviews of Berkeley and San Francisco residents in the 1970s. Appleyard asked residents along streets with various traffic volumes to rate such subjective factors as danger for children from traffic, appearance of the street, pollution, noise from traffic, general traffic danger, and careless drivers. One finding was that, while some general relationships exist between the perceived threat from traffic and traffic volumes on the street, the relationship is complex. For example, on six streets with ADTs under 1,000 vehicles, respondents bothered by "danger for children from traffic" ranged from under ten percent (Beaumont Street) to 50% (Shotwell Street). Appleyard classified streets with "light traffic" as having under 2,000 ADT, but Salem Spitz has placed this threshold at 1,200 ADT.

Quantitative Evaluation

Most of the studies noted above provide a method for setting a threshold between acceptable and unacceptable levels of traffic on a residential street but do not indicate whether an increment of new traffic on a street would or would not be noticeable to residents. The only method which provides this type of evaluation appears to be the TIRE Index (Traffic Infusion on a Residential Environment) developed by Donald Goodrich. According to documentation provided by Goodrich:

> TIRE is a numerical representation of a resident's perception of the effect of street traffic on activities such as walking, cycling and playing, and on daily tasks such as maneuvering an auto out of a residential driveway. TIRE is expressed by index values that range from zero, representing the least effect of traffic, to five, representing the severest effect. TIRE is based on a logarithmic association between traffic and residential environment and as such predicts three interesting relationships. According to TIRE a given change in street traffic volume will cause a greater impact on residential environment on a street with a low pre-existing traffic volume that it will on a street with a higher pre-existing traffic volume. Yet, any traffic change that would cause an index change of 0.1 or more would be noticeable to street residents. Streets with TIRE levels above the midrange index of 3 are traffic-dominated, while those with indexes below 3 are better suited for residential activities.

Goodrich cites the work done by Appleyard and Buchanan as sources but provides no other specific documentation or justification for the 0.1 threshold of noticeability. No documentation is available to explain how the TIRE Index values were derived or how the threshold of noticeability was determined.[3] In the absence of another method to perform this task, the TIRE method was used to assess the impacts of the project.
TIRE Index values are based on ranges of ADTs. Using the mid-range values to estimate the TIRE Index values, the formula for calculating a TIRE value is:

> TIRE Index Number = 0.434 (ln (ADT)) where:
> ln = natural logarithm function (base = 2.7182...)
> ADT = Average daily traffic on the street

Table A-1 shows the TIRE evaluation of project-generated traffic on the 200- and 300- blocks of Ulloa Street. The TIRE evaluation was not performed for Waithman Way because no houses face this street directly, and other streets, such as Portola Drive, were not analyzed because they are primarily thoroughfare streets. The evaluation shows that neither block of Ulloa Street would be affected by a noticeable increase in traffic, although, as of the 1988 counts, the 200-block is close to the threshold level.

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3 Telephone conversation with Donald Goodrich, December 19, 1988.

TABLE A-1
Tire Evaluation of Project Traffic
(50 Residents and 130 ADT)

	300-Block Ulloa Street	200-Block Ulloa Street
Existing ADT	824	1,088
Existing TIRE Index	2.91	3.03
ADT Added by Project	+16	+29
Total ADT with Project	840	1,117
TIRE Index with Project	2.92	3.05
Change in Index	+0.02	+0.02
Significant? a/	NO	NO

a/ Any traffic change which would cause an index change of 0.10 or more would be noticeable to street residents. The difference between the upper and lower values of ADT for the specific TIRE Index numbers is 179 ADT for a street with 820 ADT, and 209 ADT for a street with 1,081 ADT. According to TIRE's developer, these would be the values which would have to be exceeded before an impact became noticeable.

Source: DKS Associates and Donald K. Goodrich

The TIRE methodology has other limitations which include the following:

- It does not consider the time of day when traffic occurs. Noise studies, for example, weight events which occur during the "sleeping" hours of 10:00 PM to 6:00 AM more heavily than those occurring at other hours.
- It does not consider the peaking characteristics of traffic. For example, a street with an ADT of 2,000 cars per day would be treated the same if 100 or 400 cars travelled the street during the peak hour.
- It does not account for the sensitivity of residents along the street (young and old), as suggested by Buchanan.
- It does not take street grades into account. Low volumes on steep streets can be annoying because of engine and brake noises and because of the difficulty of stopping in the downhill direction.
- It does not account for the percentage of trucks and heavy vehicles in the traffic stream.
- It does not account for factors affecting noise, such as setbacks of homes from the street or whether residents have open windows facing the street.

TABLE A-2

Vehicular Levels of Service at Signalized Intersections

Level of Service	Description	Volume/Capacity (V/C) Ratio a/
A	Level of Service A describes a condition where the approach to an intersection appears quite open and open and turning movements are made easily. Little Little or no delay is experienced. No vehicles wait longer than one red traffic signal indication. Traffic operation generally can be described as excellent.	Less than 0.60
B	Level of Service B describes a condition where the approach to an intersection occasionally is used fully and some delays may be encountered. Many drivers begin to feel somewhat restricted within groups of vehicles. The traffic operation generally can be described as very good.	0.61-0.70
C	Level of Service C describes a condition where the approach to an intersection often is used fully and back-ups may occur behind turning vehicles. Most drivers feel somewhat restricted but not objectionably so. The driver occasionally may have to wait more than one red traffic indication. The traffic operation generally can be described as good.	0.71-0.80
D	Level of Service D describes a condition of increasing restriction causing substantial delays and queues of vehicles on approaches to the intersection during short times within the peak period. However, there are enough signal cycles with lower demand such that queues are cleared periodically, thus preventing excessive back-ups. The traffic operation generally can be described as fair.	0.81-0.90
E	Capacity occurs at Level of Service E. It represents the most vehicles that any particular intersection can accommodate. At capacity there may be long queues of vehicles waiting upstream of the intersection, and vehicles may be delayed up to several signal cycles. The traffic operation generally can be described as poor.	0.91-1.00
F	Level of Service F represents a jammed condition. Back-ups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the approach under consideration. Hence, volumes of vehicles passing through the intersection vary from signal cycle to signal cycle. Because of the jammed condition, this volume would be less than capacity.	1.01+

a/ Capacity is defined as Level of Service E.

Source: San Francisco Department of Public Works, Traffic Division, Bureau of Engineering, from Highway Capacity Manual, Highway Research Board, 1965.

APPENDIX C

Noise [4]

Fundamental Concepts of Environmental Acoustics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels usually are measured in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in Table A-3.

Most of the sounds which we hear in the environment do not consist of a single frequency but rather a broad band of frequencies with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting which reflects the fact that human hearing is less sensitive at low frequencies and extremely high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter which includes an electrical filter corresponding to the A-weighting curve. Typical A-levels measured in the environment and in industry are shown in Table A-4 for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distance sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{10}, L_{50}, and L_{90} commonly are used. They are the A-weighted noise levels equalled or exceeded during 10%, 50%, and 90% of a stated time period. A single-number descriptor called the L_{eq} also is widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noise generally are lower than the daytime levels. However, most household noise also decreases at night, and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, L_{dn} (day-night average sound level), was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted ten decibels higher than the daytime noise level. Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

The effects of noise on people and be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, learning.
- Physiological effects such as startling, hearing loss.

The levels associated with environmental noise, in almost every case, produce effects in the first two categories. Workers in industrial plants can experience noise in the last category. Unfortunately, there is as yet no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This primarily is because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual past experiences with noise.

[4] Appendix C prepared by Illingworth & Rodkin, Inc.

Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of the existing environment to which one has adapted: the so-called "ambient". In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers.

With regard to increases in A-weighted noise level, knowledge of the following relationships will be helpful in understanding this report.

- Except in carefully controlled laboratory experiments, a change of one decibel cannot be perceived.
- Outside of the laboratory, a three-decibel change is considered a just-perceivable difference.
- A change in level of at least five decibels is required before any noticeable change in community response would be expected.
- A ten-decibel change is subjectively heard as approximately a doubling in loudness and would almost certainly cause an adverse change in community response.

TABLE A-3
Definition of Acoustical Terms

Term	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter deemphasizes the very lower and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
L_{10}, L_{50}, L_{90}	The A-weighted noise levels which are exceeded 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of five decibels to levels in the evening from 7:00 PM to 10 PM and after addition of ten decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day-Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of ten decibels to levels measured in the night between 10:00 PM and 7:00 AM.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as prevailing ambient noise level.

TABLE A-4
Typical Sound Levels Measured in the Environment and Industry

At a Given Distance From Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50') Ambulance Sired (100')	100		Very Loud
	90	Boiler Room	
Freight Cars (50') Pneumatic Drill (50') Freeway (100')	80	Printing Press Plant In Kitchen with Garbage Disposal Running	
	70		Moderately Loud
Vacuum Cleaner (10')	60	Data Processing Center Department Store	
Light Traffic (100') Large Transformer (200')	50	Private Business Office	
	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

XI. EIR AUTHORS AND CONSULTANTS; ORGANIZATIONS AND PERSONS CONSULTED

EIR AUTHORS

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